Current Issues in Emerging eLearning

Volume 3
Issue 1 *MOOC Design and Delivery: Opportunities and Challenges*
Article 12

April 2016

Current Issues in Emerging eLearning, Volume 3, Issue 1

Volume 3, Issue 1

Special Issue on MOOC Design and Delivery: Opportunities and Challenges

CURRENT ISSUES IN EMERGING ELEARNING

Volume 3, Issue 1 (2016/04)
ISSN: 2373-6089
Special Issue on MOOC Design and Delivery: Opportunities and Challenges

Available online at: http://scholarworks.umb.edu/ciee/

ADVISORY BOARD

TABLE OF CONTENTS

FOREWORD: MOOC DESIGN DISCUSSIONS WELL PAST THE YEAR OF THE MOOC
Alan Girelli – CIEE Editor-in-Chief / Leslie Limon, Copy Editor, Revision Advisor..... 1

LEARNING THROUGH DESIGN: MOOC DEVELOPMENT AS A METHOD FOR EXPLORING TEACHING METHODS
Robin Bartoletti 9

HOW THE COMMUNITY BECAME MORE THAN THE CURRICULUM: PARTICIPANT EXPERIENCES IN #RHIZO14
Sarah Honeychurch, Bonnie Stewart, Maha Bali, Rebecca J. Hogue, Dave Cormier 26

WHAT IS IT LIKE TO LEARN AND PARTICIPATE IN RHIZOMATIC MOOCS? A COLLABORATIVE AUTOETHNOGRAPHY OF #RHIZO14
Maha Bali, Sarah Honeychurch, Keith Hamon, Rebecca J. Hogue, Apostolos Koutropoulos, Scott Johnson, Ronald Leunissen, Lenandlar Singh 41

QUALITY MANAGEMENT OF LEARNING MANAGEMENT SYSTEMS: A USER EXPERIENCE PERSPECTIVE
Panagiotis Zaharias and Christopher Pappas 60

FROM INSTRUCTIVISM TO CONNECTIVISM: THEORETICAL UNDERPINNINGS OF MOOCS
Matt Crosslin..... 84

CLOSING THE LOOP: BUILDING SYNERGY FOR LEARNING THROUGH A PROFESSIONAL DEVELOPMENT MOOC ABOUT FLIPPED TEACHING
Donna Harp Ziegenfuss 103

WHO IS A STUDENT: COMPLETION IN COURSERA COURSES AT DUKE UNIVERSITY
Molly Goldwasser, Chris Mankoff, Kim Manturuk, Lorrie Schmid, Keith E. Whitfield 125

APPLYING A COMMUNITY OF INQUIRY INSTRUMENT TO MEASURE STUDENT ENGAGEMENT IN LARGE ONLINE COURSES
Carol A.V. Damm 138

MOVING BEYOND MOOC MANIA: LESSONS FROM A FACULTY-DESIGNED MOOC
Julia Parra 173

PARTICIPANT EXPERIENCE OF THE FIRST MASSIVE OPEN ONLINE COURSE (MOOC) FROM PAKISTAN
Syed Hani Abidi, Aamna Pasha, Syed Ali 205

AUTHOR BIOS 219

FOREWORD: MOOC STUDIES WELL PAST THE YEAR OF THE MOOC

Alan Girelli – CIEE Editor-In-Chief / Leslie Limon – Copy Editor, Revision Advisor

As we move nearly a half-decade beyond *The New York Times'* declaring 2012 the "Year of the MOOC" (Pappano, 2012), the range of discussants involved in discourse on MOOCs has narrowed, yet the sophistication of scholarship produced continues to deepen. This second in a two-part series of special issues of *Current Issues in Emerging eLearning* celebrates this rich, new scholarship on MOOC theory and practice. Volume 3, Issue 1: *MOOC Design and Delivery: Opportunities and Challenges* presents an underlying argument: that the MOOC frontier can inform our decisions regarding all manner of educational approaches, from clickers in the classroom to evolving competency-based models. Given *CIEE*'s "intentionally eclectic" mission to promote "scholarship on the disruptions teaching with technology bring to all segments of the marketplace" and to publish "critical assessments of eLearning in its many forms," [1] upcoming issues of this journal will provide heterogeneous coverage of eLearning topics, though editorial board members welcome this opportunity to share a second collection of important MOOC research studies in this publication.

The issue opens with Robin Bartoletti's LEARNING THROUGH DESIGN: MOOC DEVELOPMENT AS A METHOD FOR EXPLORING TEACHING METHODS, a case study of the role self-reflection plays in the design process. Bartoletti describes how designers' concerns regarding MOOC "interaction and dialogue led her design team to construct knowledge through *reflection-in-action* (at the moment of teaching) and *reflection-on-action* (action planned before or after teaching)." Ultimately, she concludes:

> The technology tools and pedagogical practices utilized in MOOCs vary from those used in more traditional online education. The methods of content delivery and instruction may be different as well. However, interaction in a MOOC remains the crux of the matter, just as in other delivery formats. (p. 13).

Many of the authors represented in this special issue share Bartoletti's view that evolving tools and teaching methods can empower learners but also can impose potentially unwelcome demands upon learners. Therefore, these evolving tools and methods represent both opportunities and challenges for designers and instructors. Some authors take an arguably extreme stance regarding the changing

[1] Quoted from the *CIEE* "Mission and Scope" page on web at http://scholarworks.umb.edu/ciee/aimsandscope.html.

definitions of the roles of learner and teacher, as in the case of the second and third articles in this issue. These two articles provide complimentary autoethnographies of 'rhizomatic' learning, centered on experiences within the now famous "#rhizo14" MOOC. Bali et al describe how "[te]acher and student roles are radically restructured," in rhizomatic learning: "Course content and value come mostly from students, not the teacher, who, at best, is a curator providing a starting point and guidance" (p. 44). Honeychurch et al applaud the way rhizomatic learning "effectively decentered content almost entirely," (p. 37) but acknowledge some participants "expressed discomfort with the lack of formal structure, the laid-back facilitation," and other non-traditional aspects of the rhizomatic teaching and learning scenario.

For those who embrace this new learning situation, however, the consequences are lasting. In HOW THE COMMUNITY BECAME MORE THAN THE CURRICULUM: PARTICIPANT EXPERIENCES IN #RHIZO14, Sarah Honeychurch et al chronicle a phenomenon Bartoletti describes as "one of the most fascinating parts of the ETMOOC experience … that the community continues to thrive nearly three years after it first formed …" (p. 20). Honeychurch et al similarly identify long-term affiliations among participants as an unintended benefit of participation in a connectivist MOOC. The authors attribute their ongoing gains from the course to the course emphasis on contribution and creation encouraged by a sense of 'eventedness' rather than content mastery. Notably, while this study includes commentary from #rhizo14 originator, Dave Cormier, the study names Cormier last in authorship and qualifies his role as 'facilitator" of the MOOC:

> Cormier did not prepare the curriculum and content in advance. Instead, as facilitator, he watched as participants chose from content already available on the web and repackaged that to suit themselves, or created their own content and interacted with each other's original or curated content. (p. 28).

The third article in this issue, WHAT IS IT LIKE TO LEARN AND PARTICIPATE IN RHIZOMATIC MOOCS?: A COLLABORATIVE AUTOETHNOGRAPHY OF #RHIZO14, provides a companion autoethnography. Maha Bali et al present the rhizomatic model of learning as "not simply greater than the sum of its part/icipants," declaring that to understand rhizomatic learning we should "[t]hink of a conscious mind emerging from the orchestrated firings of a cluster of neurons" (p. 42). Bali and her co-authors describe a learning model devoid of central authority but in no way dispute Cormier's importance to their experience in #rhizo14. Rather, they applaud his temperance and humility, commend his ability to set up learning situations, and then remove himself as an obstacle to their co-exploration of ideas. In his narrative, co-author Lenandlar Singh writes that "these MOOCs allow you to be you. You can become the self-appointed facilitator" (p. 49). Statements of this ilk suggest the rhizomatic model provides a hyperbolic example of the

disaggregation of the teaching role, a trend closely associated with online learning paradigms. Norman Friesen and Judith Murray maintain that "'disaggregation' of instructional role and content is already commonplace in universities and distance education institutions" (p. 202). Adéle Bezuidenhout places disaggregation amid a cluster of interrelated phenomena addressed by authors throughout this special issue:

> The rapidly evolving nature of the distance educational context has implications …, for example the emergence of open educational practices, the increasing range of distance education providers including virtual universities and private providers, the paradox of increased access versus accessibility of the internet in developing countries, cloud-based learning, increasing sometimes unrealistic expectations of online students, connectivism, and the disaggregation of the academic role (Naidu, 2014). The change in teacher roles from mainly being a content creator, to acting as discussion leader to becoming a critical friend and co-learner (Anderson and Dron, 2011) corresponds with the development of the different generations of distance education. (2015, p. 2)

The fourth article in this special issue, QUALITY MANAGEMENT OF LEARNING MANAGEMENT SYSTEMS: A USER EXPERIENCE PERSPECTIVE provides a qualitative, empirical analysis of learners' perceptions of current delivery technologies. The study points out flaws in current evaluation methods of online delivery, offering both a critique and an alternative evaluation schema. The study underscores important, problematic aspects of user experience identified by other authors in this issue. Specifically, Zaharias and Pappas examine how the evaluation of conventional learning management systems (LMS) "focuses only on the capabilities in relation to administration and management of teaching and learning" but lacks "a conceptual framework and evaluation model of LMS through the lens of User Experiences (UX) research and practice" (p. 62).

> Design of these environments has to support a whole range of learners' needs. Learners seek opportunities to apply their knowledge to solve real problems; they want to be able to explore new contexts; they need to find connections and build communities of practice (Lombardi, 2007). Especially for building communities of practice, we see that key tenets of connectivism (Siemens, 2004) suggest meaning-making and forming connections between specialized communities are important activities. Emerging learning technologies such as MOOCs try to incorporate these kinds of opportunities in order to provide rich and meaningful learning experiences. We assert that modern LMS platforms also need to evolve towards these directions. (p. 71)

From this analysis of user centered design in personal learning environments provided by Zaharias and Pappas, the issue moves to the fifth article, a discussion by author Matt Crosslin regarding user centered design of instruction itself. FROM INSTRUCTIVISM TO CONNECTIVISM: THEORETICAL UNDERPINNINGS OF MOOCS presents a framework for analyzing the goals of a proposed MOOC to determine appropriate epistemology, methodology, communication types and power structures. While Crosslin's analysis remains largely at the theoretical level, his work closely parallels Bartoletti's case study of design team members' processes for exploring, rejecting, and adopting various design models for their specific MOOC purposes. As do all authors in this issue, Crosslin acknowledges the significant influence connectivism exerts on MOOC design. Calling for "unbiased alignment of course goals to epistemology [as a means to] set the foundation for the design stage," Crosslin writes:

> [I]f analysis suggests the power structure inherent in the learning goals leans toward connectivism, course design would need to include relatively little direct instruction, and would involve more ill-structured problems, interactive exercises, learner-determined activities, and even artifacts based on learner preferences rather than pre-determined structures (such as papers, tests, etc.). (p. 90)

Donna Harp Ziegenfuss provides the sixth article of this special issue: CLOSING THE LOOP: BUILDING SYNERGY FOR LEARNING THROUGH A PROFESSIONAL DEVELOPMENT MOOC ABOUT FLIPPED TEACHING. This case study explores use of a "backward design process" to render a faculty professional development MOOC providing "an online project-based learning experience that integrated learning about the flipped classroom and about how to flip a classroom as the participants designed flipped teaching materials" (Abstract, p. 103). "Closing the loop" refers to a conclusion drawn from the case study: that course designers and instructors should rethink how they monitor and assess learning in MOOC contexts. When Ziegenfuss suggests "technology tools and online learning environments are being heralded as possible solutions to make teaching and learning more efficient, effective, interactive, and collaborative" (p. 108), she invokes a theme pervasive throughout this compendium: the interaction of method and technology serves as means to an end: to make (or allow) the learner to take responsibility for learning, and to create an 'anti-pedagogy,' in the sense that learning ceases to be about what the teacher does to/for the students, ceases even to be about what the teacher facilitates, but rather becomes about what learners do for themselves, each other, and the teacher.

Ziegenfuss describes how, during data collection, her research team "interviewed some participants who appeared to be 'lurkers' in the course asking about their actual engagement with course content" (p. 113). "MOOCs are often

criticized for the low MOOC completion rates," she notes, questioning "is this really a good measure of MOOC learning?" (p. 113). Here Zeigenfuss introduces sentiments echoed by authors who contribute the seventh article of this issue, "WHO IS A STUDENT: COMPLETION IN COURSERA COURSES AT DUKE UNIVERSITY" (Goldwasser, M. et al). The Duke University authors identify challenges created by the lack of "clear operational definitions about who constitutes a learner at the outset of the course," then examine "factors that predict different learner participation levels," noting "the decision of which definition to use should be intentional," based on the purpose of an analysis of MOOC participation (Abstract p. 125). The researchers' methodology underscores their chief concern in the study:

> [W]e present different ways to define a student based on course activities. This includes defining a student as someone who: 1) enrolled in the course, 2) ever visited the course website, 3) watched any video lecture, 4) viewed the discussion forum, or 5) submitted any graded assignment. For each of the five possible definitions, we present regression models that indicate the likelihood of various demographic measures correlating with someone fitting the definition of a student. (p. 129)

The Duke team suggests "useful information about when and how individuals use course elements, regardless of whether they ultimately complete the course, can inform understandings regarding learner engagement with the material" (p. 128).

Each of the three articles that close this special issue address aspects of learner engagement among MOOC participants. The eighth article is titled APPLYING A COMMUNITY OF INQUIRY INSTRUMENT TO MEASURE STUDENT ENGAGEMENT IN LARGE ONLINE COURSES. With this study, Carol A.V. Damm joins Zacharias and Pappas in examining massive learning in corporate contexts. Zacharias and Pappas examine learning through a survey conducted among participants using "a well-known industrial e-learning portal, elearningindustry.com" (p. 67), whereas Damm's study reports on engagement in situations in which a "U.S. book publisher (BP) offers online courses with an average course participation of 400 students on a commercial learning management system … headlined by authors of popular books that this organization publishes …" (p. 141). Damm notes:

> One challenge of an online course is to keep students motivated and ensure their absorption of the material. The large number of students who register for Massive Online Open Courses (MOOCs) but do not complete them, and/or do not stay engaged throughout, has been a principal component of the criticism of the efficacy of this course genre for making quality education available to all. (p. 142)

Damm sets out to learn why the publisher's "courses suffer from two of the standard problems associated with Massive Online Open Courses (MOOCs): high dropout rates and inconsistent participation among all but a small percentage of learners" (p. 142). She studies students "using a mixed methodology based on the validated Community of Inquiry (CoI) survey" to learn if "low engagement rates in large online courses correlate with weak social presence, teaching presence, and/or cognitive presence," and to discern if the CoI instrument can measure "student's engagement or non-engagement with a large online course" (p. 140).

In the ninth article of this issue, Julia Parra continues discussion of the complex design decisions that impact learner engagement in MOOCs. Parra's case study, MOVING BEYOND MOOC MANIA: LESSONS FROM A FACULTY-DESIGNED MOOC, records the efforts of this instructor/designer/researcher to wrap a traditional graduate college course regarding learning design, technology and innovation around a MOOC of the same topic using ADDIE design principles. Working through successive approximations across multiple semesters, Parra has revised a course she runs within a conventional LMS, concluding:

> Current LMSs are not conducive to massive collaborative group projects as I design them. Collaborative group projects will not be a part of my design for the next MOLO. A MOLO just about collaboration is possible but collaboration, as part of the MOLO learning design, still needs work. (p. 197)

Essentially, Parra arrives at the conclusion Zacharias and Pappas reach: that one needs a different sort of personal learning environment to support MOOC participation. Parra's statement of limited success running a MOOC through a conventional LMS contrasts sharply with the #rhizo 14 autoethnographers' narratives regarding their effective learning and engagement using social media platforms. After acknowledging the challenges she and learners faced participating in the open version of her course, Parra cites "a MOOC learner and researcher from Rwanda" to explain her own motives for continuing to offer MOOCs (p. 175):

> Bernard Nkuyubwatsi (2013) … focuses on the role of MOOCs in democratizing education. … Nkuyubwatsi also sees MOOCs' potential for "improving the quality of access to higher education" through the affordances of openness, flexibility, and 24/7 access. (p. 175)

Parra applauds the achievements of her graduate students, closing her case study with accounts of their gains through the course, including this narrative:

> One student, literally the only student at our university from his country, shared during a face-to-face class conversation that the Internet access in his country is inaccessible and that his hopes were that when it becomes more available, he wants to be ready for his people with resources for teaching and learning English. This student has made incredible progress, coming from a country where he had no access to the Internet to recently being hired as a K12 technology coordinator. (p. 201)

Fittingly, the tenth and final article of this special issue on MOOCs provides a case study leading to the conclusion that scholars from low-and-middle-income countries (LMIC) should begin producing their own MOOCs. In PARTICIPANT EXPERIENCE OF THE FIRST MASSIVE OPEN ONLINE COURSE (MOOC) FROM PAKISTAN, Syed Hani Abidi, Aamna Pasha and Syed Ali examine why enrollments in MOOCs remain low among peoples from low-and-middle-income countries.

The authors describe their launch in 2014 of a three-week course that "covered current concepts and techniques used in computer-based drug design," a course that "attracted 230 enrollments including undergraduate, graduate and post-graduate students, healthcare professionals, researchers and university faculty" (p. 206). The study analyzed learners' perspectives on the course "[u]sing data gathered through an online survey" regarding "concerns and expectations their participants identified, and what might be the factors deterring a potential LMIC participant from enrolling in a MOOC" (p. 207). The authors conclude:

> The prospective LMIC MOOC participant is eager to partake of resources that are time- and cost-efficient, and are effective in enhancing knowledge and skills. However, to make the future MOOC experience more rewarding it is imperative to spread computer literacy more widely in the LMICs. Moreover, LMIC nations such as Pakistan acknowledge their own unique learning cultures and experiences when they produce and share their MOOC offerings with the world. (p. 211)

This heartfelt and carefully researched argument from Pakistani scholars, coupled with Parra's inclusion of encouraging news from the Rwandan academic, Bernard Nkuyubwatsi, suggest the MOOC community may be reinvesting in the promise proffered by early advocates, including the *New York Times* which was offered in this bold statement in 2012: "Welcome to the brave new world of Massive Open Online Courses – known as MOOCs – a tool for democratizing education" (Lewin, 2012).

ACKNOWLEDGEMENTS

This forward is the product of a collaboration that began with astute observations Leslie Limon made as she edited copy and provided final revision suggestions for all ten articles in this special issue. Alan Girelli expanded and fully articulated the concepts and intertextual connections Leslie had identified, adding a few ideas of his own. Julia Parra and Apostolos Koutropoulos graciously reviewed drafts of the Foreword, and provided corrections and revision comments.

REFERENCES

Anderson, T. & Dron, J. 2011. Three generations of Distance Education Pedagogy. *International Review of Research in Open and Distance Education*, *12*(3), 80-97.

Bezuidenhout, A. (2015). Implications of distance educator's changing work roles for academic workload. *Distance Education*, (1): 1-17. http://uir.unisa.ac.za/bitstream/handle/10500/18930/Implications%20for%20academic%20worksload%20of%20the%20changing%20role%20of%20distance%20educators.pdf?sequence=1&isAllowed=y

Friesen, N., & Murray, J. (2013). 'Open Learning 2.0'? Aligning Student, Teacher and Content for Openness in Education. *E-Learning and Digital Media*, *10*(2), 200-207.

Lewin, T. (2012). Instruction for masses knocks down campus walls. *The New York Times*, *4*.

Lombardi, M. M. (2007). Authentic learning for the 21st century: An overview. In D. G. Oblinger (Ed.), *EDUCAUSE Learning Initiative.*

Nadu, S. (2014). Looking back, looking forward: the invention and reinvention of distance education. *Distance Education*, *35*(3): 263-270, http://dx.doi./org/10.1080/01587919.2014.961671

Nkuyubwatsi, B. (2013). Evaluation of Massive Open Online Courses (MOOCs) from the learner's perspective. *The 12th European Conference on e-Learning ECEL-2013, 30-31 October 2013, Sophie Antipolis, France.*

Pappano, L. (2012). The Year of the MOOC. *New York Times*. Retrieved from: http://www.nytimes.com/2012/11/04/education/edlife/massive-open-online-courses-are-multiplying-at-a-rapid-pace.html?pagewanted=all&_r=0

Siemens, G. (2004). Connectivism: A Learning Theory for the Digital Age. *elearnspace.* (2004). Retrieved from: http://www.elearnspace.org/Articles/connectivism.htm

LEARNING THROUGH DESIGN: MOOC DEVELOPMENT AS A METHOD FOR EXPLORING TEACHING METHODS

Robin Bartoletti
University of North Texas Health Science Center

ABSTRACT

Exploring new pedagogical approaches and technologies in learning experiences such as MOOCs offers educators a clear opportunity to reflect on and expand their teaching methods and document effective practices. However, while research has affirmed the value of self-reflection as an important means to improve one's pedagogical practices, very limited data about self-reflection during course design exists for online instructors in higher education. A team of MOOC course designers thus seized the opportunity to investigate whether they could improve their teaching practices by engaging in a connectivist and reflective process to create an innovative MOOC. The MOOC design team for Educational Technology and Media Massive Open Online Course (ETMOOC) created a virtual laboratory for reflecting on the pedagogical approaches and technologies they were considering. The underlying question they sought to answer was whether their experiences with the connectivist design process would impact their own self-reflective teaching practice. The design team encouraged exploration of various pedagogical models, leveraged the web to create connected learning experiences, networked learning, and reflected on the design throughout the development of the course. For the author, designing, developing, and teaching a MOOC created trigger moments for improving teaching. The author provides a list of suggested practices for reflecting on teaching and improving course design for Massive Open Online Courses (MOOC) in particular.

KEYWORDS: MOOC, cMOOC, connectivist MOOC, instructional design, reflection, self-reflection, connectivism, Taggard Model, social media, learning community, learner-centered

LEARNING THROUGH DESIGN: MOOC DEVELOPMENT AS A METHOD FOR EXPLORING TEACHING METHODS

Robin Bartoletti[i]
University of North Texas Health Science Center

INTRODUCTION

Learning design involves a wide set of instructional decisions, knowledge, skills, and competencies. Online teaching and learning design involves, in addition, wide opportunities to innovate. The challenge—which is complicated by the proliferation of course models—lies in making it easier for educators to adopt innovative design (Moe, 2014; Rizvi, Donnelly, & Barber, 2013; Voss, 2013). The issue for online educators is to identify the most effective course designs and teaching skills, and use them in ways that will engage students in meaningful, challenging, and engaging learning experiences. Reflective practice of learning design is a mindset that transforms teaching by guiding educators to be more thoughtful and intentional about their instructional decisions (Schon, 1996). In our efforts to do so, we educators constantly self-evaluate and reflect on all aspects of our courses and teaching design to improve and expand our teaching strategies. While research has affirmed the value of self-reflection as an important means of improving one's pedagogical practices, very limited data regarding self-reflection during course design exists for online instructors in higher education.

When designing a MOOC, a team of educators from across the globe identified the opportunity to investigate whether the course designers could contribute to improving teaching practice (Gaebel, 2014) by reflecting on innovation in course design. The underlying question was whether the course designers' experiences with the MOOC design process impacted self-reflective teaching practice. In response to this opportunity, I compiled a list of suggested practices for reflecting on teaching and improving course design for Massive Open Online Courses (MOOC) in particular. This set of reflective practices is based on the personal experiences of instructors who collaborated on course design, during which process each person contributed his or her expertise. The reflective practice took place during initial design and delivery and after the completion of the MOOCs. The lessons learned were then re-used and refined for additional MOOC designs.

REFLECTION AND REFLECTIVE PRACTICE

John Dewey (1933) describes reflection as "an active and persistent careful consideration of any belief or knowledge." Reflective practice is understood as the process of learning through and from experience towards gaining new insights of self-and/or practice (Boud and Fales, 1983; Jarvis, 1992). Reflective practice in teaching involves an examination of the way one teaches and decisions regarding what areas need improvement. Reflective practice is related to metacognition - the ability to think about one's thoughts regarding teaching with the aim of improving learning (Wilson & Conyers, 2014). Research has shown that instructors who self-reflect have greater confidence and create more positive learning environments that lead to higher student achievement (Hartman, 2001, p. xi). Richards (1995) explained that "becoming a reflective teacher involves moving beyond a primary concern with instructional techniques and 'how to' questions" (para. 2) to ask deeper questions regarding instruction. Through my own experiences, I've come to believe that self-reflection on teaching as well as metacognitive thinking occur readily during course design, delivery, and redesign of MOOCs delivered by groups of educators. The more MOOCs grow and evolve as a format for online courses, the greater the need for educator designers to have basic knowledge in this area. Laurillard and Ljubojevic (2011) recommend that instructors designing and teaching online courses adjust their approach rather than simply transferring their previous face-to-face approaches to the online format. Caudle and Moran (2012) highlight the importance of reflection when making this adjustment. MOOC design accentuates the need for reflection, since the transfer of previous online learning practices may not work as well with the larger and often more diverse audiences participating.

Bartlett and Rappaport (2009) and Alteen, Didham and Statton (2009) found that faculty members' reflection produced the most long-term impact on their professional development. Hativa (2000) claims teaching practices need to change to improve teaching quality as do other personal characteristics that impact teaching: pedagogical knowledge, beliefs about teaching, and beliefs about students. Donald Finkel (2000) wrote that teaching should be "providing experience, provoking reflection," since

> … to reflectively experience is to make connections within the details of the work of the problem, to see it through the lens of abstraction or theory, to generate one's own questions about it, to take more active and conscious control over understanding. (p. 153)

According to educational psychologist Robert Slavin (2006), one characteristic of outstanding teachers is intentionality, or constructive self-awareness in teaching. Intentional instructors methodically consider the impact their actions have on

learners and use relevant evidence to support the strategies they select; they strive to improve their effectiveness over time. One way to accomplish intentionality is through self-reflection, which requires practical, personal insight into what works in a learning situation.

I have found that designing and developing, as well as teaching, a MOOC has led me to reflective practice. As John Sener tells us in *The Seven Futures of American Education: Improving Learning & Teaching in a Screen-Captured World*, "online education can turn teachers from being reflexive to being reflective" (2012). The process of designing, developing, and collaborating in MOOC design can improve practice through reflection, but, as Sener states, "[i]t is not automatic" (2014). Scott (2013) found teachers change their beliefs about teaching when they have the opportunity to collaborate and discuss their work with colleagues. If an educator goes through the whole process of designing, developing, and delivering a MOOC using a personal learning network, resources shared by others, and adaptations of successful strategies, that educator reflects upon teaching practice in ways that greatly increase the likelihood of improved teaching. In the design of the Educational Technology and Media Massive Open Online Course (ETMOOC), the course discussed here, group collaboration and discussion have driven the reflective process. As more and more MOOCs are created, we are seeing learning design teams forming that comprise educators and scholars from all over the globe. The more voices in the mix, the more ideas are shared. The process of group decision-making drives reflection (Sener, 2014). For ETMOOC, design and development involved a working team of 21educators who improved the design of the course and instigated reflection among the designers and participants, a phenomenon Couros has identified (2012). The educator design team was drawn together by the course topic and in smaller groups by specific interests. Design team members widely report finding the result was reflective, exciting, and motivating.

DESIGNING AND DEVELOPING A MOOC

Team-based MOOC design as introduced above may include the following roles: learning designer, subject matter expert, graphic designer, instructional technologist, social media manager, interaction facilitator, and multimedia developer (Puzziferro and Shelton, 2008). Each of these roles may be assumed by one or several educators. The MOOC design team for ETMOOC encouraged exploration of a variety of pedagogical models, leveraged the web to create connected learning experiences, networked learning, and included reflection on the design throughout the development of the course. Jones and Steeples (2003) refer to "networked learning" as "learning in which information and communication technology is used to promote connections: between one learner

and other learners, between learners and tutors; between a learning community and its learning resources" (p. 2).

The MOOCs I have co-designed have involved a large volume of communication conducted through a variety of technologies among the designers operating as community members. This communication during design often has led to exploration of the use of personalized and networked reflective practice. Our communication has often taken place via social media tools. This aligns with evolving MOOC design practice: Social media tools have become essential to MOOC design because these tools enable connectivity, communication, and interaction (deWaard, Abajian, Gallagher, Hogue, Keskin, Koutroupoulos & Rodriguez, 2011). Social media can lead to interaction and dialogue that become central to the learning design, as the network of designers and learners establish essential social presence. In the case of ETMOOC design, interaction and dialogue led the design team to construct knowledge through *reflection-in-action* (at the moment of teaching) and *reflection-on-action* (action planned before or after teaching) (Schon, 1987). Reflection consisted of several stages: Typically the educators identified a question regarding teaching or learning, proposed actions to address the question, gathered and analyzed data, then evaluated the solution.

CONNECTIVISM: CENTERING ON LEARNERS IN A DIGITAL AGE

The literature reveals that the technology tools and pedagogical practices utilized in MOOCs vary from those used in more traditional online education. The methods of content delivery and instruction may be different as well. However, interaction in a MOOC remains the crux of the matter, just as in other delivery formats. "Interactions have a direct influence on learners' intellectual growth" (Hirumi, 2002). Meaningful interactions result from learners responding, negotiating internally and socially, arguing points, evolving ideas using alternative perspectives, and solving real tasks (Jonnassen et al., 1995; Lave & Wenger, 1991; Vygotsky, 1978). The emerging technologies and creative thinking about teaching and learning represented by the MOOC model call for new pedagogies that specifically foster meaningful interactions in large, networked learning environments. By exploring the different pedagogical approaches and technologies in learning experiences such as MOOCs, educators can reflect upon and expand methods of teaching and document effective practices.

The ETMOOC design and delivery I experienced leaned heavily toward connectivist pedagogy. Connectivism has been described as a learning theory for a digital age, a theory that situates the student at the center of his or her own learning (Kop & Hill, 2008; Siemens, 2005; Dunaway, 2011; Tschofen & Mackness, 2012; Ravenscroft 2011). Connectivism seeks to strengthen the

tendency of learners to engage in an intentional learning process by enabling those learners to form connections between sources of information, and therefore to create useful information patterns (Siemens, 2005). One goal of connectivism is to engage learners in an overtly social and networked learning experience, with the goal of extending learners' knowledge base and empowering them to become lifelong learners (Chetty, 2013). Utilizing this pedagogical model requires that the instructor create a learner-centric learning environment and then guide learners through the learning experience. In becoming a guide the instructor optimally also reflects constantly on the course and on the connections that develop among the participants, materials, and learning. Connectivism is largely about self-education *structured as a distributed network*, and *aggregated together using technology*.

Couros identifies the following activities associated with connectivist inquiry as helpful to MOOC designers and learners: Orient, declare, network, connect, and find a purposeful way to apply their newly acquired knowledge (2009). Connectivists assert that the learning experience cannot center on the instructor but instead must be about the learner, about the content and the activities (Downes, 2012). The teaching role moves from that of controlling classroom activities to influencing or shaping the network; control is replaced by influence (Dunaway, 2011).

In the case of MOOC design, connectivism directly relates to reflective practice. The process resembles methods described by the Taggart Model of Reflective Thinking, albeit with one chief difference. While the Taggart model guides the attainment of goals and intended learning outcomes through expanded opportunity and support for learning success, connectivist pedagogy guides the attainment of the goals and intended learning outcomes through networks, navigation activities, and the use of tools or media appropriate for exploring concepts and reflective thinking (Sui Fai John Mak, 2013).

MOOC DESIGN AS REFLECTIVE LABORATORY: ETMOOC

Like good teaching, good course design takes attention and hard work every time. With MOOCs, the process of design and development lends itself to an experimental and reflective technique because some constraints are lifted while new constraints are imposed, leading to opportunities for creative thinking and problem solving. In the case of the design and development of ETMOOC, the design team, described by Couros as "conspirator," (2013) worked within a Google group. Within this collaborative work space, design team members were able to define, refine, and reflect on the MOOC design. Figure 1 below provides screenshots of artifacts of ETMOOC designers' interactions in our Google group.

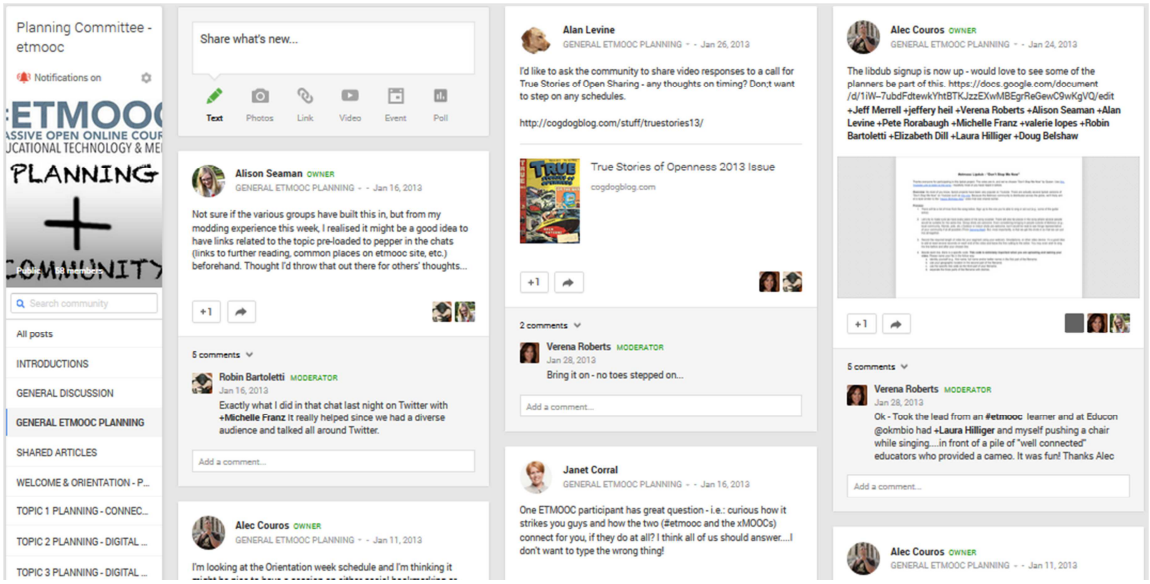


Figure 1: ETMOOC Planning Google Group

A wide variety of design and development activities took place in the Google group, including:

- Interactions and communications regarding the MOOC during pre-design, design, delivery, and post-design.
- Collective intelligence and crowdsourcing of MOOC content, references, and resources.
- Discussion of MOOC order and flow and strategies for learning activities.
- Resource aggregation of particular MOOC topics and subtopics.
- Live co-editing of course design documents.
- Nomination and selection of topic experts.
- Original content creation and gathering of existing unique activities to create learner engagement.
- Gleaning, defined by Booth as observation, documentation, integration, acknowledgement, and incorporation of the connections (2011, p. 26), all of which occurred through collaboration and participation in the learning design.

Another aspect of the ETMOOC course design process that added to reflection involved the fact that the design process was opened to learners as well as designers. The ETMOOC open design process in part helped the design team to address the challenges of MOOC design identified in the literature. Anyone could join in the design Google Group and contribute to the course design and/or give opinions on design decisions. This openness resulted in a rich dialogue and

shared thought. The open forum encouraged collaboration and self-review that led members of our design team to consider and reconsider our teaching strategies and approach.

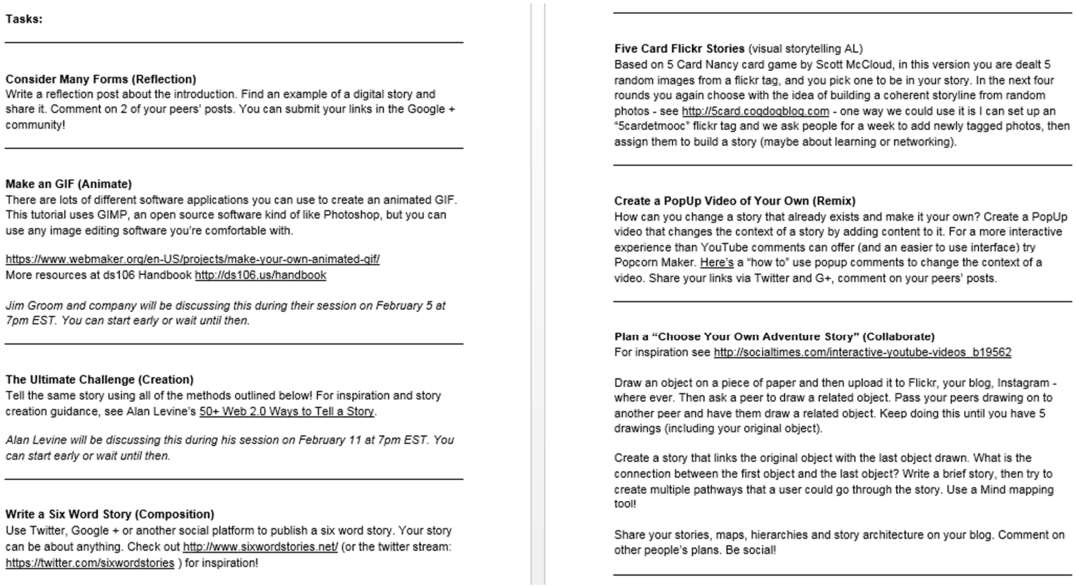
MOOC designers design for unknown participants who will enter the MOOC with various levels of background knowledge and experience (Macleod, Haywood, Woodgate, & Sinclair, 2014). This learner diversity creates a challenge for design team members who must create learning experiences that are adaptable for novice students while providing personalized learning pathways that induce critical thinking for advanced students.

Figures 2 and 3 below document the design team's efforts to accommodate the unknown learner population and meet the need for personalizing learning paths for learners with disparate degrees of preparedness for study of the course topic, educational technology.

Draft Calendar:

DATES (2012)	TOPIC	OVERVIEW	
Mar 10-16 **Week 9**	Citizenship, Identity, Footprint (Overview & Implementation)		suggestion: ask Bonnie Stewart Is a continuation of media/digital literacy, in my opinion, which is appropriate? Same resources listed above are appropriate this week, as well.--Debbie Fucoloro I (Catherine Cronin) have been working w/ 2nd year students & academic staff exploring digital identity issues & ideas... would love to work with Bon Stewart (& others) on this. Will speak with Bonnie.
Mar 17-23 **Week 10**	Privacy, Corporatization, & Other Issues with Web 2.0	- Issues of commodification **Discussion of**: Google, Facebook - privacy tools (ghostery, VPN, Https Everywhere)	suggestion: ask Robin Wharton Could also fall under media/digital literacy umbrella.--Debbie Fucoloro
Mar 24-30 **Week 11**	Open Movement: Open Access, Open Educational Resources, MOOC Movement (What Educators Need to Know)	- the philosophy of open - the culture of open - Connectivism	Suggestion: George Siemens/Or Wiley? Brian Lamb / Scott Leslie/Stephen Downes. We (will) have a recording of Wiley/Cable green that can be repurposed for this - on Finding and using OER//Robin Bartoletti
Mar 28-Apr 4 **Week 12**	Ed Tech Implementation: Classrooms & Courses	- Ed tech in the classroom - Online education - Building a personal cyberinfrastructure (Gardner Campbell) - interest-based project work that use the web as the platform	Suggestion? Wendy Drexler? Can help with this one:verena - if don't need PhD. Not sure where this is going?--Debbie Fucoloro Robin Bartoletti - I can help

Figure 2: ETMOOC Topic Planning Calendar excerpt



Tasks:

Consider Many Forms (Reflection)
Write a reflection post about the introduction. Find an example of a digital story and share it. Comment on 2 of your peers' posts. You can submit your links in the Google + community!

Make an GIF (Animate)
There are lots of different software applications you can use to create an animated GIF. This tutorial uses GIMP, an open source software kind of like Photoshop, but you can use any image editing software you're comfortable with.

https://www.webmaker.org/en-US/projects/make-your-own-animated-gif/
More resources at ds106 Handbook http://ds106.us/handbook

Jim Groom and company will be discussing this during their session on February 5 at 7pm EST. You can start early or wait until then.

The Ultimate Challenge (Creation)
Tell the same story using all of the methods outlined below! For inspiration and story creation guidance, see Alan Levine's 50+ Web 2.0 Ways to Tell a Story.

Alan Levine will be discussing this during his session on February 11 at 7pm EST. You can start early or wait until then.

Write a Six Word Story (Composition)
Use Twitter, Google + or another social platform to publish a six word story. Your story can be about anything. Check out http://www.sixwordstories.net/ (or the twitter stream: https://twitter.com/sixwordstories) for inspiration!

Five Card Flickr Stories (visual storytelling AL)
Based on 5 Card Nancy card game by Scott McCloud, in this version you are dealt 5 random images from a flickr tag, and you pick one to be in your story. In the next four rounds you again choose with the idea of building a coherent storyline from random photos - see http://5card.cogdogblog.com - one way we could use it is I can set up an "5cardetmooc" flickr tag and we ask people for a week to add newly tagged photos, then assign them to build a story (maybe about learning or networking).

Create a PopUp Video of Your Own (Remix)
How can you change a story that already exists and make it your own? Create a PopUp video that changes the context of a story by adding content to it. For a more interactive experience than YouTube comments can offer (and an easier to use interface) try Popcorn Maker. Here's a "how to" use popup comments to change the context of a video. Share your links via Twitter and G+, comment on your peers' posts.

Plan a "Choose Your Own Adventure Story" (Collaborate)
For inspiration see http://socialtimes.com/interactive-youtube-videos_b19562

Draw an object on a piece of paper and then upload it to Flickr, your blog, Instagram - where ever. Then ask a peer to draw a related object. Pass your peers drawing on to another peer and have them draw a related object. Keep doing this until you have 5 drawings (including your original object).

Create a story that links the original object with the last object drawn. What is the connection between the first object and the last object? Write a brief story, then try to create multiple pathways that a user could go through the story. Use a Mind mapping tool!

Share your stories, maps, hierarchies and story architecture on your blog. Comment on other people's plans. Be social!

Figure 3: ETMOOC Activity/Task planning example

SOCIAL COURSE DESIGN

Social media tools are essential to connectivist MOOCs because these tools promote connectivity, communication, and interaction (deWaard et al., 2011). Couros asserts that knowledge creation is central to the learning process (Couros, 2009; Milligan et al., 2013). Moreover, social sharing provides a sense of connectedness that enhances learning and helps learners create and reflect meaning through discourse (Kop, 2011). In the case of ETMOOC, our use of social media provided design team members with similar opportunities for knowledge creation and learning. Interaction and dialogue among the course designers led to reflection that proved central to learning design because the designers (themselves learners), by networking, were able to share how they had created knowledge in the design process.

REFLECTING WHILE TEACHING

According to Couros (2009), the guiding principles for an open, social, connected course such as a connectivist MOOC are that instructors assume the role of facilitators and social connectors rather than that of lecturers or knowledge delivery systems. Connectivist MOOCs such as ETMOOC are developed so that learners engage in social knowledge creation and participate in collaborative activities. Online synchronous events via social media draw a community of educators together and help grow MOOCs because community members typically invite their colleagues and friends to join the event and thus expand the community. Stewart has observed that social media tools can increase course

enrollments as friends and colleagues recommend courses to one another through social networks (2013). This process of evangelizing occurred during the course design phase of ETMOOC—open to the public, as noted above—and during the run of the course itself. In consequence, both the design team grew in numbers and levels of commitment through our social media connections, and our learning community at large grew through social media use. Adams et al. (2014) have confirmed Cormier's notion that MOOCs are event-based learning experiences, and that this "eventedness" contributes to the uniqueness of MOOCs.

Research on online education suggests that the presence of facilitators and participants throughout a course and across various social media networks enhances the sense of community in a course (Kilgore & Lowenthal, 2014; Kop, 2011). In ETMOOC the participants were socially very active. The MOOC design seems to have been successful at exploiting networked learning principles to foster at large scale the situation one group of educational researchers has dubbed "highly motivated, personally relevant, and socially situated learning" (Macleod, Haywood, Woodgate, & Sinclair, 2014, p. 246).

INSTRUCTIONAL DEVELOPMENT/DESIGN PROCESS

ETMOOC design team members tested the concepts and practices we acquired through course development using a cycle of informal reflective practice. Informal reflection involves self-questioning and helps develop awareness of one's own assumptions (Shoffner, 2008). Our goal for engaging in cycles of informal reflection was to apply what we were learning in the development of future MOOCs. The instructional design process evolved to include a reflective process of collection, and transformation through self-questioning and collaboration, as outlined below. We suggest that the practices described are useful for reflecting on and improving course design for Massive Open Online Courses.

- Employ a team-based approach to MOOC design.
- Collect, research, and gather resources and ideas to support topics.
- Curate and cull resources and ideas through a group process of reflective thinking and discussing.
- Explore new, older, and sometimes beta tech tools to create powerful learning experiences.
- Connect, reflect, and reclaim ideas, tools and resources through open conversation about what is most meaningful.

Conole & Willis assert that a key principle of learning design is to make the design process explicit and shareable (2013). Strategies to support explicit, shareable learning design include visible learning (Hattie, 2015), flexibility, adaptation, intellectual play, and reflective practices of development and teaching. Table 1 below shows some of those methods that can be used for design of future MOOCs. Note that many include an element of reflective practice.

Visible learning	Flexibility	Adaptation	Intellectual play	Reflective Aspect (Taggart, 2005)
Blog	Offer a variety of choices for blogging	Base comments and adaptation of the content upon groupthink/input	Research, remix, and add	Frame problems
Google Group	Open the group - allow anyone to join	Create knowledge collaboratively and reflect on that knowledge	Think, puzzle, explore as thinking routines	
Google Hangouts	Open the hangout – allow anyone to join	Operate with no set agenda other than the topic of the week/module		
Wiki	Open Wikispaces for public development	Share & curate resources among group members	Label, categorize or tag, and strategically link ideas and content	Gather data, schema, and context
Remixing	Modify existing materials	Use technology and learning strategies to transform content and ideas	Connect and adapt to own experiences	Reframe problems
Design visible activities that support or bring perspect-ive to the content	Examples: Animated gifs Video interviews Hangouts Video introductions Voice/video Feedback	Design that provides an essential structure with coaching to enable participants to adapt their own versions of the activity (Brown and Edelson, 2013)	Design team members themselves complete the course work to be provided to students to increase likelihood activities are all "doable." The input from a diverse team further increases the likelihood that global learners will be able to perform the tasks	Experiment
Discuss-ion	Host improvisations in which materials may provide a "seed" idea, but participants contribute the bulk of the design effort required to bring the activity to fruition (Brown & Edelson, 2013)	Focus iterations, review, and redesign to improve the instructional moment	Debate the benefits and pedagogy of each activity	Observe, Judge, Evaluate

Table 1: Explicit MOOC instructional design and development process pieces

DEVELOPMENT OF MOOCS ENHANCES REFLECTIVE TEACHING

In my experience, designing, developing, and teaching a MOOC created what Waite et al. describe as trigger moments for improving teaching (2013). Those triggers facilitated reflection immersed in an atmosphere of collaboration. Conole (2013) defines course design as a "methodology for enabling teachers/designers to make more informed decisions in how they go about designing learning activities and interventions, which is pedagogically informed and makes effective use of appropriate resources and technologies." Keppell et al. (2011) state, "[a]cademic teachers should be encouraged to model and share learning designs within their own university, partner institutions and symposiums and conferences in higher education" (Recommendation 8). Modeling and sharing learning designs certainly occurred among members of the design team of the MOOC discussed herein. Participants in ETMOOC shared their reflections regarding the MOOC and have shed light on whether they themselves anticipated any long-lasting effects from the MOOC design process in their own daily practice. Overall, ETMOOC designers assessed participation in design of the MOOC as successful. They enjoyed learning and using motivational tools, group collaboration and peer engagement. ETMOOC co-designer Daniel Bassill (2013) reflected on his experience as follows:

> I've been using technology to communicate, gather ideas, and support the work I do in Chicago since I first started using computers in 1980. The MOOC has provided a constant flow of new ideas. Over the past two (now three) years, starting with ETMOOC, it was often with the goal of encouraging other people in my network to join in and take advantage of the learning as well as encouraging those within the MOOC who share the same goals as I do, to connect with me in my own efforts….Having a network of people to help you find information to support your learning, and problem solving, enhances your efforts.

ETMOOC design team member Peggy George (2013) describes learning courage as part of the ETMOOC experience:

> I'm thankful for the "permission" to learn, lurk, share and explore in MY OWN WAY ....While I have enjoyed being on this journey with so many educators I know and respect, I wasn't sure I had the courage to actually take the step to create a blog and reflect publicly. There have been so many powerful connections and learning experiences, but it only took one that finally motivated me to take that next step and create my reflection blog for ETMOOC!... It's a small step for most, but a big step for me.

Paul Signorelli (2014) expresses a similar sentiment when he shares that "one of the most fascinating parts of the ETMOOC experience is that the community continues to thrive nearly three years after it first formed, as we saw again through our latest online tweet chat."

REFLECTIONS ON LEARNING DESIGN IN MOOCS

As discussed above, MOOCs are designed for a heterogeneous international audience (Matkin, 2014). This situation invites the blending of design approaches to meet the needs of diverse learners. During this time of immense diversity of learning populations, technological change, pedagogical exploration, and educational innovation, there is a need now more than ever for online courses, especially MOOCs, to be built by educational teams comprising a variety of roles such as learning architect, graphic designer, and video production specialist. While research has affirmed the value of self-reflection as an important means of improving one's pedagogical practices, very limited data regarding self-reflection during course design exists for online instructors in higher education.

Typically in MOOC development, the content, media, and design approach incorporates a variety of learning strategies enabled by technologies such as interactive audio and video, webinars, microblogging sites, discussion tools and social media. Strategies that rely so centrally on technology tools impose a new layer of responsibility upon the course designer and instructor. These strategies also open a new window of opportunity to explore what works well in MOOCs. It is critical that educators continue to expand thinking about how learners learn using technology. MOOCs can create a networked community in which learners share content, make it their own, and expand on the ideas of the community by adding back into the network of learners (Downes, 2012).

Our team's experience demonstrated to us the significance of self-reflection in improving online instructional design. One might reasonably conclude that when MOOC instructors and developers engage in self-reflection, they not only improve selected aspects of their own teaching practice, but also model best practices for others who may be developing MOOCs in the future. I further suggest that reflective practices can help us to expand our design repertoires beyond the standard operating procedures we use in daily practice.

REFERENCES

Alteen, A. M., Didham, P. and Stratton, C. (2009). Reflecting, refueling, and reframing: a 10-year retrospective model for faculty development and its implications for nursing scholarship. *Journal of Continuing Education for Nurses*, *40*(6), 267-272.

Adams, C., Yin, Y., Vargas Madriz, L.F., & Mullen, S. (2014). A phenomenology of learning large: The tutorial sphere of xMOOC video lectures. Distance Education, 35, 202-216. Retrieved from http://www.veletsianos.com/tag/research/#sthash.IdgyYVpt.dpuf

Bartlett, P. F., and A. Rappaport (2009). Long-Term Impacts of Faculty Development Programs: The Experience of TELI and Piedmont. *College Teaching 57*(2), 73–82.

Bassill, D. (2014). ETMOOC Google group. Message posted to https://plus.google.com/115900934043806039683/posts

Booth, C. (2011). *Reflective Teaching, Effective Learning*. Chicago, IL: ALA Press.

Boud, D. and Fales, A. (1983). Reflective learning: key to learning from experience. *Journal of Humanistic Psychology*, 23(2), 99-117.

Brown, M. and Edelson, D. (2003). Teaching as design: Can we better understand the ways in which teachers use materials so we can better design materials to support their changes in practice? *National Science Foundation LeTUS Report Series.*

Caudle, L. A., & Moran, M. J. (2012). Changes in understandings of three teachers' beliefs and practice over time: Moving from teacher preparation to in-service teaching. *Journal of Early Childhood Teacher Education, 33*(1), 38-53.

Chetty, D. (2013). Connectivism: Towards a technology-centered pedagogical transition in religious studies. *Alternation, Special Edition 10*, 172 - 199.

Conole, G. (2013). *Designing for learning in an open world*. New York: Springer.

Conole, G. & Wills, S. (2013). Representing learning designs—making design explicit and shareable. *Educational Media International, 50*(1), 24-38.

Cormier, D. (2010). Community as curriculum and open learning, Dave's Educational Blog, 17 June [online]. Retrieved from http://davecormier.com/ edblog/ 2010/ 06/ 17/ community-as-curriculum-and-open-learning

Couros, A. (2009). Open, connected, social–implications for educational design. *Campus-Wide Information Systems, 26*(3), 232-239.

Couros, A. (2012) ETMOOC Community. Retrieved from https://plus.google.com/communities/116116451882856472187

Couros, A. (2012) ETMOOC website. Retrieved from http://etmooc.org/

deWaard, I., Abajian, S., Gallagher, M., Hogue, R., Keskin, N., Koutropoulos, A., & Rodriguez, O. (2011). Using mlearning and MOOCs to understand chaos, emergence, and complexity in education. *The International Review of Research in Open and Distance Learning, 12*(7), 94-115. Retrieved from http://www.irrodl.org/index.php/irrodl/article/view/1046/2026

Dewey, J. (1933). *How We Think.* Boston, MA: D. C. Heath & Co.

Downes, S. (2012, March 23). [Web log message]. Retrieved from http://halfanhour.blogspot.com/2012/03/education-as-platform-mooc-experience.html

Dron, J. (2012). The pedagogical-technological divide and the elephant in the room. *International Journal on E-Learning, 11*(1).

Dunaway, M. (2011). Connectivism: Learning theory and pedagogical practice for networked information landscapes. *Reference Services Review, 39*(4), 675-685.
doi: 10.1108/00907321111186686

Finkel, D. (2000). *Teaching with your mouth shut.* New York, NY: Heinemann.

Gaebel, M. (2014). Massive Open Online Courses. EUA Occasional Papers.

George, P. (2013, March 10). ETMOOC. Message posted to https://plus.google.com/113641967896023574483/posts/UxmpT322wqx

Hativa, N. (2000). Becoming a better teacher: a case of changing the pedagogical knowledge and beliefs of law professors. *Instructional Science, 28*(5), 491-523.

Hattie, J. (2015, March). The applicability of Visible Learning to higher education. *Scholarship of Teaching and Learning in Psychology*, *1*(1), 79-91.

Hirumi, A. (2002). Interactivity in distance education: Current perspectives on facilitating e- learning. *Quarterly Review of Distance Education, 3*(2), v-viii.

Jarvis, P. (1992). Reflective practice and nursing. *Nurse Education Today*, *12*(3), 174-181.

Jones, C. and Steeples, C. (2003). *Perspectives and issues in networked learning.* London: Springer Verlag.

Keppell, M., Riddle, M., Sellers, W., Souter, K. (2008). *Spaces for knowledge generation: a framework for designing student learning environments for the future.* La Trobe University, Charles Stuart University, Kneeler Design Architects, Apple Inc.

Kilgore, W., & Lowenthal, P. R. (2015). The Human Element MOOC: An experiment in social presence. In R. D. Wright (Ed.), *Student-teacher interaction in online learning environments* (pp. 373-391). Hershey, PA: IGI Global.

Kop, R. (2011). The challenges to connectivist learning on open online networks: Learning experiences during a massive open online course. *The International Review Of Research In Open And Distance Learning, 12*(3).

Kop, R., & Hill, A. (2008). Connectivism: Learning theory of the future or vestige of the past? *The International Review of Research in Open and Distance Learning*, *9*(3). Retrieved from http://www.irrodl.org/index.php/irrodl/article/viewArticle/523/1103

Laurillard, D. & Ljubojevic, D. (2011). Evaluating learning designs through the formal representation of pedagogical patterns. In C. Kohls & J. Wedekind (Eds.), *Investigations of e-Learning Patterns: Context Factors, Problems and Solutions* (pp. 86-106). Hershey, PA: IGI Global.

Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*. Cambridge, UK: Cambridge University Press.

Macleod, H., Haywood, J., Woodgate, A, & Sinclair, C. (2014). Designing for the unknown learner. *EMOOCs 2014 European MOOC Stakeholders Summit, Experience Track* 245-248.

Matkin, G. (2014) How MOOCs present massive opportunities for research on learning. Retrieved from http://unex.uci.edu/pdfs/dean/matkin_130807_moocs.pdf

Milligan, C., Littlejohn, A., & Margaryan, A. (2013). Patterns of engagement in connectivist MOOCs. *MERLOT Journal of Online Learning and Teaching*, *9*(2), 149-159. Retrieved from http://jolt.merlot.org/vol9no2/milligan_0613.htm

Puzziferro, M. and Shelton, K. (2008). A model for developing high quality online courses: Integrating a systems approach with learning theory. *Journal of Asynchronous Learning Networks*, *12*(3-4). Retrieved from http://files.eric.ed.gov/fulltext/EJ837519.pdf

Ravenscroft, A. (2011). Dialogue and connectivism: A new approach to understanding and promoting dialogue-rich networked learning. *The International Review of Research In Open And Distance Learning*, *12*(3), 139-160. Retrieved from http://www.irrodl.org/index.php/irrodl/article/view/934/1676

Richards, J. C. (1995). Towards reflective teaching. *English Teacher's Journal, 48*, 59-63.

Scott, K.M. (2013). Does a university teacher need to change e-learning beliefs and practices when using a social networking site? A longitudinal case study. *British Journal of Educational Technology*, *44*(4), 571-580.

Sener, J. (2012). *The Seven Futures of American Education: Improving Learning & Teaching in a Screen-Captured World*. North Charleston, SC: CreateSpace.

Shoffner, M. (2008). Informal reflection in pre-service teacher education. *Reflective Practice 9*(2), 123-134.

Siemens, G. (2005). Connectivism: A Learning Theory for the Digital Age, *International Journal of Instructional Technology and Distance Learning, 2*(1).

Signorelli, P. (2014, Dec 2). Post ETMOOC. Message posted to https://plus.google.com/104017204598614298654/posts

Slavin, R. (2012). *Educational psychology theory and practice.* New York, NY: Pearson.

Stewart, B. (2013). Massiveness openness = new literacies of participation. *Journal of Online Learning and Teaching*, *9*(2), 228-238. Retrieved from http://jolt.merlot.org/vol9no2/stewart_bonnie_0613.htm

Mak, Sui, Fai, J. (2013). Is Connectivism a New Learning Theory? – Part 2. Retrieved from https://suifaijohnmak.wordpress.com/2013/05/03/is-connectivism-a-new-learning-theory-part-2/

Moe, R. (2014). A finished dissertation – MOOC pasts and futures [Web log post]. Retrieved from http://allmoocs.wordpress.com/2014/06/24/a-finished-dissertation-mooc-pasts-futures/

Rizvi, S., Donnelly, K., & Barber, M. (2013). An avalanche is coming: Higher education and the revolution ahead. Institute for Public Policy Research. London, UK.

Taggart, G., &Wilson, A. (2005). *Promoting reflective thinking in teachers.* Thousand Oaks, CA: Corwin Press.

Tschofen, C., & Mackness, J. (2012). Connectivism and dimensions of individual experience. *The International Review Of Research In Open And Distance Learning*, *13*(1), 124-143. Retrieved from http://www.irrodl.org/index.php/irrodl/article/view/1143

Voss, B. D. (2013). Massive Open Online Courses (MOOCs): A primer for university and college board members. Retrieved from http://agb.org/sites/agb.org/files/report_2013_MOOCs.pdf

Waite, M., Mackness J., Roberts G., and Lovegrove E. (2013). Liminal participants and skilled orienteers: Learner participation in a MOOC for new lecturers. *MERLOT Journal of Online Learning and Teaching, 9*(2), 200-216. Retrieved from http://jolt.merlot.org/vol9no2/waite_0613.pdf

Wenger, E., McDermott, R., & Snyder, W. (2002). *Cultivating communities of practice*. Boston: Harvard Business School Press.

Wilson, D. and Conyers, M. (2014). Metacognition: The gift that keeps on giving. *Edutopia*: October 7, 2014. Retrieved from https://www.edutopia.org/blog/metacognition-gift-that-keeps-giving-donna-wilson-marcus-conyers?destination=node/452616

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.

How the community became more than the curriculum: Participant experiences in #rhizo14

Sarah Honeychurch	University of Glasgow
Bonnie Stewart	University of Prince Edward Island
Maha Bali	American University of Cairo
Rebecca J. Hogue	University of Ottawa
Dave Cormier	University of Prince Edward Island

Abstract

The paper outlines participant experiences in a rhizomatic MOOC, #rhizo14. We begin with a brief outline of the structure of the course before presenting our five participant narratives to illustrate our beliefs that, for us, the #rhizo14 community became more than the curriculum. We then discuss some of the common themes in our narratives: the role that the Facebook group held in fostering our feelings of community, how the diversity of voices in the course promoted learning and engagement of group members, the formation of sub-communities with diverse interests, and the flexibility of participation that the course encouraged. While acknowledging the partiality of our narratives, we conclude that the emphasis in #rhizo14 on contribution and creation rather than content mastery encouraged a sense of "eventedness" (shared experience), which allowed our community to thrive.

Keywords: rhizomatic learning, MOOC, cMOOC, connectivism, rMOOC

HOW THE COMMUNITY BECAME MORE THAN THE CURRICULUM: PARTICIPANT EXPERIENCES IN #RHIZO14

Sarah Honeychurch[ii]	University of Glasgow
Bonnie Stewart[iii]	University of Prince Edward Island
Maha Bali[iv]	American University of Cairo
Rebecca J. Hogue[v]	University of Ottawa
Dave Cormier[vi]	University of Prince Edward Island

INTRODUCTION

In this paper, we outline participant experiences in #rhizo14, a participatory open online course offered without formal institutional affiliation or corporate umbrella, facilitated by Dave Cormier, one of the people recognized for coining the term Massive Open Online Course (MOOC). Formally titled "Rhizomatic Learning: The Community is the Curriculum," #rhizo14 ran in January and February 2014, and was the first in a series of at least two iterations of the course (a third is planned for May 2016). It was designed to explore ideas of peer- and network-driven learning, based on the decentered connection-building of Deleuze and Guattari's (1987) rhizome metaphor. Precursors to this type of course include the first connectivist MOOCs offered by Siemens and Downes and later co-facilitated by Cormier.[1] As had been the case with these previous connectivist MOOCs (cMOOCs), #rhizo14 (a rhizomatic MOOC, or rMOOC) was organized via a variety of platforms: P2PU (a MOOC platform), a Facebook group, a Twitter hashtag, a Google Plus group, and Cormier's blog. Cormier encouraged participants to distribute engagement across their own blogs and other platforms. Approximately 500 people signed up for #rhizo14 (Cormier, 2014b, para. 2), hailing from a wide range of locations, cultural backgrounds, and professional roles. Cormier's goal for #rhizo14 was to enact and model the rhizomatic learning approach. Rhizomatic learning is "a story of how we can learn in a world of abundance" (Cormier, 2014a, para. 3).

The course design of #rhizo14 is noteworthy. In cMOOCs that predate #rhizo14, course content is organized around content pre-set by the course instructor(s)/facilitator(s). However, for #rhizo14, Cormier did not prepare the curriculum and content in advance. Instead, as facilitator, he watched as

[1] For a brief discussion of connectivism see http://www.learning-theories.com/connectivism-siemens-downes.html

participants chose from content already available on the web and repackaged that to suit themselves, or created their own content and interacted with each other's original or curated content. Cormier explained his operating assumptions for the course design as follows:

> In the rhizomatic model of learning, curriculum ... is constructed and negotiated in real time by the contributions of those engaged in the learning process. This community acts as the curriculum, spontaneously shaping, constructing, and reconstructing itself and the subject of its learning in the same way that the rhizome responds to changing environmental conditions (Cormier, 2008, Rhizomatic Model of Education section, para. 1).

Intended as a free, six-week exploration of rhizomatic learning, #rhizo14 was structured around weekly questions and distributed discussions of emergent issues. Cormier issued an invitation to participate on his blog (Cormier 2013). There was no content delivery *per se* beyond short weekly video introductions to each question; videos were posted on the P2PU pages. (See Cormier 2013 for a link to this course design.) Participants constructed the curriculum of the course as they engaged with the questions and with each other. At its conclusion (Cormier, 2014b), Cormier referred to #rhizo14 as an event, in keeping with his previously articulated concept of "eventedness," or the "'shared event' that takes learning beyond a simple knowledge transaction between student and instructor" (Cormier, 2009). Course questions focused on commonplace concepts to which participants had differing and deeply felt responses. One example of a prompt question Cormier posed reads as follows: "Is books making us stupid?", an ironic and provocative play on Nicholas Carr's (2008) oft-quoted "Is Google making us stupid?" rhetoric. Find directly below a full list of topics Cormier seeded into the #rhizo14 course:

> Week 1—Cheating as Learning
> Week 2—Enforcing Independence
> Week 3—Embracing Uncertainty
> Week 4—Is Books Making Us Stupid?
> Week 5—Community as Curriculum
> Week 6—Planned Obsolescence (Cormier 2014b)

The extent to which #rhizo14 succeeded was something of a surprise to Cormier. Given the diversity of perspectives and the way the course was distributed over multiple platforms, the possibility of #rhizo14 devolving into chaos was real. Yet among a group of participants, most of whom were unknown to one another prior to the start of the course, what emerged were sustained channels for meta-discussions—and heated debate—about community, learning, and dissemination in an era of knowledge abundance. We suggest that one

criterion for determining if or when "eventedness" or "community as curriculum" occurred would be evidence of participants taking ownership of the conversation, either by continuing it after the end of the "official" course, or by introducing new topics of conversation without consulting the facilitator. Both of these occurred during #rhizo14. The Facebook group (which consisted of around 300 members) continued to thrive for more than a year, dissolving only when Cormier offered #rhizo15. Discourse in this Facebook group in particular moved beyond formal interactions to in-depth meaning-making and engagement among many participants. As we interpret the #rhizo14 experience, this course did not end when the facilitator brought it to a close at the end of the six-week term. Rather, the "community as curriculum" theme manifested to such an extent that participants continued to facilitate and engage discussions even without Cormier. Cormier himself noted, "[a]fter my last goodbye was sent out to the participants, a 'Week 7' popped up on the website" (Cormier, 2014c, section Zombie MOOC para. 1). We argue that #rhizo14 was a successful example of Fullan's (2012) framework for the educational use of technologies: "The integration of technology and pedagogy to maximize learning must meet four criteria. It must be irresistibly engaging; elegantly efficient (challenging but easy to use); technologically ubiquitous; and steeped in real-life problem solving" (p. 33).

NARRATIVES

The most useful way to show how interactions in #rhizo14 embodied the community as curriculum theme will be to present, then analyse, our own participant narratives. When the five of us decided to write this paper, we first wrote our own sections without sight of the others, then we added them to a collaborative document when each of us was happy with our own narrative.

Dave Cormier:

#Rhizo14 was the first open course I've started on my own. Most MOOCs I've worked on have been run by groups, and while there are definite collaborative advantages there, you also end up reverting to norms for agreement. Here, I had the chance to really try something new, to test the community as curriculum model. The goal was to create a sense of "eventedness," i.e. a sense of something happening that might spark the "'shared event' that takes learning beyond a simple knowledge transaction between student and instructor" (Cormier, 2009).

I wanted the course to be distributed, with multiple platforms and sites of engagement, and I wanted those platforms to be under the control of participants, not only me. So I sought people out and offered up the controls over Google Plus and Facebook, as community platforms. I think the fact that the Facebook group has been the primary site of #rhizo14 continuing long after the course has a lot to do with me not having any kind of final say over that site. If we see open courses

as native to the internet, and we don't need to prove that we're transmitting/negotiating content or providing approved structures, we're free to do things in different ways.

The course was pretty much the opposite of the Khan Academy model of delivering tidy little pieces of content to chew on. Instead, the people who participated took it in particular directions and gave it its flavor and its shape. This was possible because #rhizo14 had no institutional ties or obligations. There's no credential at the end, and no expectation that every participant should have the same outcome. The institutional stamp on course content legitimizes it, makes it look as if it's important from some kind of neutral perspective, whereas when I was saying, "Hey, come explore this with me!" that's a different thing, a different social contract.

In the first week, I made some attempt to be a teacher, to do summative responses, pull together themes …. then I realized that was counter to my intentions for the course. So I decided to pull back, and luckily people were willing, for the most part, to accept that. Now, of course, this doesn't exactly decenter me: in discussions, people sought out what had been written on rhizomatic learning and I've written a sizeable chunk of that content, so that affected the discourse that circulated in the course. And the weekly video questions still reinforced a fairly-centralized power position. But I saw the invitation to the course as an invitation to a party: I said, "I have this sandbox that I've been building castles in and I'd like you to come over and play." While I thought people would go home from the party after six weeks, many didn't … that's great. The shared experience has done its job. It raises all kinds of important questions about belonging and ownership in an age of abundance, which is what rhizomatic learning should do, as far as I'm concerned.

Sarah Honeychurch:

I'd signed up for a few xMOOCs before #rhizo14, but never engaged, partly because the delivery was too rigid, and partly because of unfamiliarity with the platforms—despite good intentions, I'd forget to return. I was keen to participate in #rhizo14 because I have a background in philosophy and welcomed the chance to talk to others about Deleuze and Guattari, but I still found it hard to remember to log into P2PU. However, I didn't need to because #rhizo14 had a Facebook group and that was where the majority of my interactions with the #rhizo14 community took place. Junco (2011) suggests that this type of use of Facebook can be beneficial to student learning, and it definitely was for me.

The main difference between #rhizo14 and my other MOOC experiences was that participation was effortless—it was merely an extension of my everyday life (Clark 2012). I'm always logged into Facebook—it's the first tab I open in the morning and the last one I close at night. I use Facebook groups to support

undergraduates and I have regular academic conversations with my friends, while at the same time chatting to my family and looking at pictures of cats. I've stopped feeling guilty about possible procrastination and begun to appreciate that my online life is an important part of my identity. I know that some people like to make a sharp delineation between their work and personal interactions; I find it impossible to compartmentalise my life in such a way. One feature of the #rhizo14 group that inadvertently contributed to this was that it was an open Facebook group. This meant that my Facebook friends who were not members of the group were able to see threads I had commented upon in their newsfeeds. I welcomed this as it drew even more diverse voices into the conversation– particularly as my "real life" friends would initiate conversations about #rhizo14 in face-to-face meetings.

A particular richness of #rhizo14 for me was that, unlike my newsfeed or many other groups I belong to, there was a diversity of voices within the group with a range of very different opinions. I felt there was an unspoken etiquette within the group to respect others even while you might not agree with them. I found myself open to listening to points of view that, at first glance, were antithetical to my own world-view and, instead of dismissing them, taking them seriously. Sometimes I found that I changed my mind about what I believed as a result, other times we begged to differ; at all times I felt that I had learned more as a result of the exchanges. Importantly, there was no need to reach a consensus: It was acknowledged that contradictory points of view could and would exist within the same community. #Rhizo14 has now become the academic community I belong to (as, for example, Ljepava et al (2013) use this concept) and it's my first point of call when I need help or support.

Maha Bali:

#Rhizo14 is the learning community I could not have face-to-face, marked by open expectations of participation and interaction, but more importantly, a willingness to discuss education from different perspectives. As a group, many of us probably lean towards dissenting from tradition, challenging the status quo. The first topic of "cheating as learning" was provocative, and I imagine that it attracted people who were eager or at least willing to turn our most entrenched educational ideas/ideals upside down. Topics of later weeks also challenged us to break out of hegemonic ways of thinking, yet to remain critical of our own radicalness. I think the topics helped, but it was the diversity of approaches and responses within the community that promoted my learning through #rhizo14. It stopped being a "course" for me early on. It was a professional development experience that later became a community I could fall back on for both professional and personal topics.

I have asked myself: What was new and special about #rhizo14? Barriers to entry were low: There were no long videos or required readings (only Dave's blogpost and five-minute video) but I ended up reading so much more in terms of other participants' blogposts, links, and conversations on blogs and Facebook. We had participants who registered part-way and became central contributors, people who participated via Twitter tangentially, and people who joined the Facebook group after the course was over and integrated smoothly. Face-to-face, it is much more difficult to enter a room full of strangers who know each other and have no one to talk to. Early on, Dave encouraged us to find others who had not connected yet, and start talking to them. As educators, I felt many took that to heart throughout the course and beyond.

Most #rhizo14 participants were social-media-literate/competent educators: It would probably have been different if we had never used social media before and were not thinking regularly about pedagogical issues and how technology influences human and social interaction and learning. cMOOCs cannot scale well for people not digitally literate about social media (Bali, 2014) .

Quite quickly, #rhizo14 Facebook became my "homebase": If I was taking another MOOC, attending an online conference, I wanted to know who from #rhizo14 was doing the same, and to discuss it with them. I could talk to my face-to-face colleagues during our workday, but I could carry on a continuous conversation with #rhizo14 via Facebook or Twitter and have it carry over any time of day or night because of the time zone diversity. #rhizo14 is the community that is "always there," doing it by choice.

Bonnie Stewart:

#Rhizo14 was designed and run during six weeks of a rather long winter. I live with Dave, #rhizo was his project, and while interested, I hadn't really intended to participate. But #rhizo14 pulled me in by offering something that went far beyond the content of the course: It fostered an active, open inquiry and discussion space that has become a core learning community for me—a constellation of invigorating conversations—for issues of online education and knowledge.

It was Facebook that made the difference, to my surprise: When Dave first created the Facebook group, he invited me in to test how it worked. Then, early in the course, someone dug up and shared an old blog post of mine on rhizomatic learning. An extensive conversation ensued, and because the course "recognized" my name as a group member, I got an update each time anyone contributed to the thread. The intersection of lively discussion and repeated signalling eventually drew me into the conversation: I was literally "interpolated" (Althusser, 1971) or called into being as a participant in the group. The technology itself shaped my sense of belonging to the course by making #rhizo14 a constant, ambient, learning-focused presence in my daily social space.

What kept me there was the people, and the sense of something emerging that I hadn't seen before. I have seldom had the opportunity to engage in such open, exploratory, choral conversations with such a diversity of peer participants. The Facebook group was highly relational and interactive, rich in what Tu and McIssac (2002) call social presence, or the "measure of the feeling of community that a learner experiences in an online environment" (p. 131). The fact that questions were the only central structure in #rhizo14 encouraged this sense of social presence: Once "right answers" are off the educational table, conventional teacher/student roles get opened up and people are free to engage, lead, and explore according to their strengths and interests. Sometimes I posted multiple times in a single day, without feeling I was taking up too much space. Other times, I went days without feeling obliged to check in, because there was a critical mass of voices always ready to take conversations in new directions. The geographic and cultural diversity of these leading voices was a new experience in itself: Daily opportunities to talk through complex educational issues in a context where dominant contributors come from as far afield as Guyana, Scotland, Egypt, the Philippines, and France are, sadly, rare for me. I don't want to idealize this diversity; the majority of participants were still North America- and UK-based, and conversation was entirely in English, but it was nonetheless the most culturally distributed learning conversation I've experienced in fifteen years in international and online education. It was also one in which women's voices were often in the lead, which in the area of educational technologies is still unusual.

Rebecca Hogue:

January was a busy time, so I decided to lurk in #rhizo14. I was drawn to it when Dave Cormier mentioned it over beers during an ice storm at the MOOC Research Initiative Conference in Arlington Texas. To be honest, I didn't find the first few weeks that inspiring, but I still had a strong desire to participate at least peripherally. Something interesting was happening and I wanted to be a part of it.

In the past, I have engaged in MOOCs primarily through my blog, and occasionally through Twitter. So, when the #rhizo14 Facebook group started, I figured I'd give that a try. It is interesting how other MOOC platforms attempt to imitate the Facebook type discussions, but have never successfully drawn my interest, and yet the #rhizo14 discussions did. #rhizo14 also had P2PU discussions, but I found the interface too frustrating. I could not overcome the inertia needed to participate in a new platform, whereas Facebook was already part of my daily workflow.

A turning point for me was when a member of the #rhizo14 community sent me a Facebook friend request. The request was sent with a personal letter and gave me permission to decide whether or not I wanted to cross the barrier between professional and personal. It was done in such a way as to avoid the

awkwardness of someone you have never met in person sending you a Facebook friend request. It was also a welcome transition, or evolution of the community. It was a sign that #rhizo14 was more than a loose connection of colleagues, but rather a community where friendships could be made.

The discussions quickly went well beyond the "course" prompts. I became more involved when #rhizo14 Facebook group became a place where we could discuss the various ethical and moral issues surrounding open research. This became a particularly hot topic after the #et4online conference, which I attended. The #rhizo14 "course" was mentioned during several keynotes; however, the people mentioning it were not active "insiders" in the community. It highlighted questions around "permission" in an "open" community. There were no right or wrong answers, and the discussions often did not come to a single conclusion or consensus. We discussed things like "Who owns a Facebook thread? Who do you need permission from before using open content, like our discussions or autoethnography?" These were big questions, and we had the freedom to explore them in a non-judgmental way. The norms of the community have allowed for challenging of ideas without personal judgments.

The experience with #rhizo14 gave me the confidence to reach out and start another community (propagating rhizomatically). When an academic blogger that I respect started a series of blog posts on learning theories, I wanted a place to discuss the different posts. I reached out to him on Twitter, and based upon our discussions I created a new Facebook group as a home for discussions. A few of the #rhizo14 regulars joined the new group, and then, within a few days over 100 people who heard about the group through various paths signed up to share insights into the various learning theories. The #rhizo14 experience demonstrated for me how a Facebook group can be used to help foster a learning community. I have used what I have learned in #rhizo14 to propagate my experience with online community learning into a new rhizomatic community with a different theme, but with the same openness to take the conversations in any direction that the participants wish. This new form of organic learning community is something that arose out of my #rhizo14 experience.

COMMUNITY AS CURRICULUM: DISCUSSION

The narratives provided above serve to illustrate our participant experiences in #rhizo14 and show how we feel that the community became more than the curriculum. What follows discusses these ideas in more detail.

> …The network ties created between people during a MOOC—because they are based on intrinsic interests and on long-term personal platforms rather than confined solely to course topics or to a course content management system—have the potential to continue as sustainable and relevant personal and professional connections beyond the boundaries of the course itself. (McAuley, Stewart, Siemens, & Cormier, 2010, p. 35)

In his narrative, Dave Cormier writes that his aims for the course were to create a sense of "eventedness" (shared experience) and to raise questions about belonging and ownership in this age of abundance. What we have written in our narratives suggest the course fulfilled Cormier's aims. In analysing all of the narratives, we have identified some common themes.

FACEBOOK'S ROLE IN COMMUNITY BUILDING

All narratives above show how contributors value the community that continued beyond the "official" course in #rhizo14. Unexpectedly, at least for us, Facebook played a key role in fostering this community. Facebook was part of many participants' daily practice: It was easy to keep up with updates, and promoted a blurring between social and professional spaces. Because Facebook was not the "official" learning environment for the course, it belonged to the community rather than the facilitator, and was limited neither by time nor topics of the course itself.

DIVERSITY OF OPINIONS AND DIVERSITY OF PARTICIPANTS

Several of the narratives also highlight how the diversity of the group promoted members' engagement and learning. Bali and Sharma (2014) cite #rhizo14 as a counter-example to much of what is wrong with xMOOCs, noting that xMOOCs are largely focused on Western-centric content and culture, often delivered didactically, whereas #rhizo14 was centered on participants bringing and sharing their own knowledge and context. As mentioned in the narratives above, some of the most active participants were from geographically dispersed countries, including Egypt (one of the authors of this article), Brazil, Guyana, and the Philippines. This diversity, however, also required some compromises from those from the West. For example, the course facilitator changed the regular hangout times to accommodate Europe/Africa time zones. Accommodating diversity also came into play during a tricky discussion early in the course regarding whether or not it was necessary for participants to read the original text of Deleuze & Guattari. (Although this was not required reading, the concept of the rhizome used in rhizomatic learning comes from their writings.) Some participants asserted that requiring this reading would exclude people who were less academic, non-native speakers, or simply not comfortable reading this difficult text. This heated discussion (which for the most part occurred one morning in the Euro-Africa time zone while the course facilitator was asleep) (Bali, 2015) resulted in some individuals from both sides of the debate leaving the course, while some others who remained became closer through this experience. It is nearly impossible for a facilitator of a distributed online course the size of #rhizo14 to accommodate everyone; in fact, accommodating all learners even within small courses in traditional settings is complicated (Bali, 2015).

The diversity of participants also allowed sub-communities to form. There were participants inclined towards collaborative creation of poetry and art, while others inclined towards conducting research about the course; these formed two separate research groups conducting research in different ways.

Flexibility of participation because of minimal required outputs

Because the "required" course content was minimal (no long videos, no required readings), participants were able to dip in and out of the course as they wanted, and this allowed for a flexibility of participation that many other courses do not accommodate. Some people felt this resulted in a lack of direction: There was no way to know if one was learning or achieving anything in particular, since goals were set by each individual for him- or herself. However, as experienced by the authors, this course "design" encouraged autonomy and allowed room for participants to set their own goals and paths and create their own "curriculum." No set reading meant people had more time to engage with each other's blogs; only one question per week meant there was time for people to set their own agendas and start discussing different things or taking the week's topic in different directions. Not everything necessarily built on prior learning or course content. Indeed, two of the participant narratives make it clear that they did not engage with #rhizo14 at the outset, but were able to join the party late without feeling a need to catch up, as late enrollment in traditional courses often requires. Because participants were able to take charge of their learning from early on, the official end of the MOOC had no significance. Participants simply continued to discuss topics that interested them; first, formally by posting new topics to P2PU after discussion on Facebook or Twitter (often the topic would have come up on someone's blog and generated enough discussion to warrant being singled out), and then eventually without any particular formality.

Importantly, #rhizo14 is not a "unique" instance of this phenomenon of a MOOC that just wouldn't die. #Etmooc, offered by Alec Couros in 2013, is another connectivist experience that created a community that continues to engage to the present day (Bali, Crawford, Jessen, Signorelli, & Zamora (2015) contains collaborative autoethnography of multiple such MOOCs including rhizo14 and etmooc).

Partiality of these narratives

One risk of a community-centered course such as this one is the possibility of participants not connecting in ways conducive to their own or others' learning, or to participation in a sustained community. The narratives shared here present the views of participants for whom #rhizo14 "worked." However, we note that elements of what made this community a success for us did not work from others' perspectives (see Mackness & Bell, 2015). Not all #rhizo14 participants were Facebook users or wanted to use Facebook for learning purposes; some chose not

to join the group and later reported feeling excluded from conversations. Some #rhizo14 participants expressed discomfort with the lack of formal structure, the laid-back facilitation, and the ways in which Facebook sociality minimized dissenting discourse in attempts to maintain social harmony. Some participants also expressed discomfort with outward displays of affection online, a behavior others considered to be authentic and helpful to community-building. A full exploration of experiences among those who did not value the #rhizo14 course as we did goes beyond the scope of this piece. Nevertheless, we feel strongly that these participants are important, we believe that their experiences are as valid as our own, and we conclude there is value in appreciating why some individuals did not feel included in the #rhizo14 course community. As Cormier has said (in an interview published by Bali & Honeychurch, 2014), exclusion is inevitable in any community because every instance of "we" automatically means "not them." We would add that any social research account can only be partial. We are making our partiality here explicit; the stories we share here are not representative of an entire community, but of a subset of that community.

For participants who continue to engage with the Facebook group and Twitter, #rhizo14 has evolved from a community focused on a curriculum to one with community as its end, not its means to any particular further goal. This parallels Sidorkin's (1999) statement that dialogue is the goal of education, not a means to another end. The goal of #rhizo14, therefore, for many of the participants who continue to engage, is the "connecting." We have now just finished the official six weeks of #rhizo15, and published a collaborative paper by #rhizo14 participants (Hamon et al, 2015). We still stay in touch and have many open social (e.g. Bali & Hogue, 2015) and professional projects together. Success, in this case, is "never finishing" (Cormier quoting Vanessa Genarelli in a Google Hangout).

CONCLUSION

While most xMOOCs to date have focused on mass-scaling educational content delivery, innovation in open online courses can take other forms: #rhizo14 effectively decentered content almost entirely, even more so than most cMOOCs. Collectively, the authors of this work have participated in many cMOOCs. We differentiate #rhizo14 from other cMOOCs in which we have participated based on our assertion that, in #rhizo14, the course community became its curriculum. This focus on community as curriculum in turn enabled that community to exceed the boundaries—and the timelines—of the course itself. The event of the course brought professionals and interested parties into contact with one another, but the emphasis on contribution rather than content mastery opened up room for divergent positions, widely diverse participation, and the eventual decision to carry on together after the official close of the course. With the advent of new

communications technologies and their integration into many people's daily lives, a new form of "eventedness" becomes possible: courses act as gathering points around which learning communities of interested professionals can congregate and grow. Embedded professional learning opportunities that foster discussion can become latent events that learners can tap into at any time, putting learners rather than content at the center and allowing the learning process to become an extension of daily practice.

ACKNOWLEDGEMENTS

We would like to thank all contributors to #rhizo14, particularly our many colleagues who have made the Facebook group such a vibrant and engaging site of learning and discussion these past months.

OPEN DATA

Data for this article does not come from any formal study, but via participation in an open Facebook group that is still active at time of submission. Members of the community active in the Facebook group have been asked and have given their collective permission to have the group linked to as part of the article; any interested readers with an active Facebook account may click the link above to peruse the body of discussion on which the authors report here.

ETHICS

Data for this article is narrative rather than empirical: Each author has simply shared his/her own experiential perspectives. Our research did not require ethical approval from an institution.

CONFLICT OF INTEREST

The authors of this paper declare there are no conflicts of interest regarding Facebook or any other commercial products and the content of this article.

REFERENCES

Althusser, L. (1971). *Lenin and philosophy and other essays*. New York, NY and London, UK: Monthly Review Press.

Bali, M. (2014). MOOC pedagogy: gleaning good practice from existing MOOCs. *Journal of Online Learning and Teaching, 10*(1), 43-56. Retrieved from: http://jolt.merlot.org/

Bali, M. (2015, April 20). Pedagogy of Care–Gone Massive. *Hybrid Pedagogy.* Retrieved from: http://www.hybridpedagogy.com/journal/pedagogy-of-care-gone-massive/

Bali, M., Crawford, C., Jessen, R. L., Signorelli, P., and Zamora, M. (2015). What Makes a cMOOC Community Endure? Multiple Participant Perspectives from Diverse cMOOCs. *Educational Media International, 52*(2), 110-115. doi:10.1080/09523987.2015.1053290

Bali, M., & Hogue, R. (2015, May 8). Virtual, hybrid, or present? The #et4buddy Conference experiment. *Hybrid Pedagogy*. Retrieved from: http://www.hybridpedagogy.com/columns/featured/virtual-hybrid-or-present/

Bali, M. & Sharma, S. (2014, April 11). Bonds of difference: Participation as inclusion. *Hybrid Pedagogy*. Retrieved from: http://www.digitalpedagogylab.com/hybridped/bonds-difference-participation-inclusion/

Carr, N. (2008, July 1). Is Google making us stupid? What the Internet is doing to our brains. *The Atlantic*. Retrieved from: http://www.theatlantic.com/magazine/archive/2008/07/is-google-making-us-stupid/306868/

Clark, D. (2012, January 18). 7 reasons why Facebook is front runner in social media learning [Blog post]. Retrieved from: http://donaldclarkplanb.blogspot.co.uk/2012/01/7-reasons-why-facebook-is-front-runner.html

Cormier, D. (2014a, January 7). What problem does rhizomatic learning solve for me? [Blog post] Retrieved from: http://davecormier.com/edblog/2014/01/07/what-problem-does-rhizomatic-learning-solve-for-me/

Cormier, D. (2014b, April 1). Explaining Rhizo14 to Oscar [Blog post]. Retrieved from: http://davecormier.com/edblog/2014/04/01/explaining-rhizo14-to-oscar/

Cormier, D. (2014c, May 25). Community learning: The zombie resurrection? [Blog post]. Retrieved from: http://davecormier.com/edblog/2014/05/25/community-learning-the-zombie-resurrection/

Cormier, D. (2013, December 27). Rhizomatic Learning—An open course #rhizo14 [Blog post]. Retrieved from: http://davecormier.com/edblog/2013/12/27/rhizomatic-learning-an-open-course-rhizo14/

Cormier, D. (2009). MUVE eventedness: An experience like any other. *British Journal of Educational Technology. 40*(3), 543-546.

Cormier, D. (2008, June 3). Rhizomatic Education: Community as Curriculum [Blog post]. Retrieved from: http://davecormier.com/edblog/2008/06/03/rhizomatic-education-community-as-curriculum/

Cuban, L. (1986). *Teachers and machines: The classroom use of technology since 1920.* New York, NY: Teachers' College Press.

Deleuze, G. & Guattari, F. (1987). *A thousand plateaus: Capitalism and schizophrenia.* Minneapolis, MN: University of Minnesota Press.

Fullan, M. (2012). *Stratosphere: Integrating technology, pedagogy, and change knowledge*. Toronto, ON: Pearson Canada.

Hamon, K., Hogue, R., Honeychurch, S., Johnson, S., Koutropoulos, A., Ensor, S., Sinfield, S., & Bali, M. (2015, June). Writing the Unreadable Untext: a Collaborative Autoethnography of #rhizo14. *Hybrid Pedagogy*. Retrieved from http://www.digitalpedagogylab.com/hybridped/writing-the-unreadable-untext/

Junco, R. (2011). The relationship between frequency of Facebook use, participation in Facebook activities and student engagement. *Computers and Education, 58*(1), 162-171. http://www.sciencedirect.com/science/article/pii/S0360131511001825

Ljepava, N., Orr, R., Locke, S. & Ross, C. (2013). Personality and social characteristics of Facebook non-users and frequent users. *Computers and Human Behaviour, 29*(4), 1602-1607.

Mackness, J. & Bell, F. (2015). Rhizo14: A Rhizomatic Learning cMOOC in Sunlight and in Shade. *Open Praxis, 7*(4), 25-38. doi: http://dx.doi.org/10.5944/openpraxis.7.1.173.

McAuley, A., Stewart, B., Siemens, G. & Cormier, D. (2010). In the Open: The MOOC model for digital practice. SSHRC Report on Knowledge Synthesis for the Digital Economy grant.

Pappano, L. (2012, November 2). The year of the MOOC. *The New York Times*. Retrieved from: http://www.nytimes.com/2012/11/04/education/edlife/massive-open-online-courses-are-multiplying-at-a-rapid-pace.html?pagewanted=all&_r=0.

Sidorkin, A. M. (1999). *Beyond discourse: Education, the self, and dialogue.* Albany, NY: SUNY Press.

Siemens, G. (2012, September 18). The Internet is happening to education [Blog post]. Retrieved from: http://www.xedbook.com/?p=54.

Stewart, B. (2013). Massiveness + openness=New literacies of participation? *Journal of Online Learning and Teaching, 9*(2), 228-238. Retrieved from: http://jolt.merlot.org/vol9no2/stewart_bonnie_0613.htm

Tu, C. H., & McIssac, M. (2002). The relationship of social presence and interaction in online classes. *The American*

WHAT IS IT LIKE TO LEARN AND PARTICIPATE IN RHIZOMATIC MOOCS?
A COLLABORATIVE AUTOETHNOGRAPHY OF #RHIZO14

Maha Bali	American University of Cairo
Sarah Honeychurch	University of Glasgow
Keith Hamon	Middle Georgia State University
Rebecca J. Hogue	University of Ottawa
Apostolos Koutropoulos	University of Massachusetts Boston
Scott Johnson	[No current affiliation]
Ronald Leunissen	Radboud University Medical Center
Lenandlar Singh	University of Guyana

ABSTRACT

In January 2014, we participated in a connectivist-style massive open online course (cMOOC) called "Rhizomatic Learning – The community is the curriculum" (#rhizo14). In rhizomatic learning, teacher and student roles are radically restructured. Course content and value come mostly from students; the teacher, at most, is a curator who provides a starting point and guidance and sometimes participates as a learner. Early on, we felt that we were in a unique learning experience that we wanted to capture in writing. Explaining #rhizo14 to others without the benefit of traditional processes, practices, roles, or structures, however, presented a challenge. We invited participants to contribute narratives to a collaborative autoethnography (CAE), which comprises an assortment of collaborative Google Docs, blog posts by individuals, and comments on those documents and posts. This strategy afforded insight into what many participants found to be a most engaging course and what for some was a transformative experience. In discussing the findings from the CAE, our intent is to benefit others interested in rhizomatic learning spaces such as cMOOCs. This authoethnography specifically addresses gaps both in the understanding of the learner experience in cMOOCs and in the nature of rhizomatic learning.

KEYWORDS: rhizomatic learning, MOOC, cMOOC, connectivism, rMOOC

WHAT IS IT LIKE TO LEARN AND PARTICIPATE IN RHIZOMATIC MOOCS?
A COLLABORATIVE AUTOETHNOGRAPHY OF #RHIZO14

Maha Bali[iv]	American University of Cairo
Sarah Honeychurch[ii]	University of Glasgow
Keith Hamon[vii]	Middle Georgia State University
Rebecca J. Hogue[v]	University of Ottawa
Apostolos Koutropoulos[viii]	University of Massachusetts Boston
Scott Johnson[ix]	[No current affiliation]
Ronald Leunissen[x]	Radboud University Medical Center
Lenandlar Singh[xi]	University of Guyana

INTRODUCTION

Higher education is in transition as information technology disrupts traditional practices, processes, and organizations. In his 2014 MOOC *Rhizomatic Learning: The Community is the Curriculum* (#rhizo14), Cormier (2014) characterizes this disruption as a shift from information scarcity to information overload and abundance. It seems intuitive that traditional processes and structures will have to change when information and expertise are readily available, remixable, and republishable through mobile phones in most pockets.

Over the past seven years, MOOCs have been a rich environment for experimentation and innovation. We, the writers of this current study, participated in #rhizo14 along with about 500 others worldwide, and for us, #rhizo14 embodies this insight: learning, including higher education, can and will change in fundamental ways. Learning, especially in the form of rhizomatic, connectivist style MOOCs, can be an emergent process in the sense that Goodenough and Deacon (2006) use the term emergent to capture those phenomena that are not merely larger, greater, or richer than their constituent parts, but that are something else altogether. A functioning, engaging, rewarding course, #rhizo14 nonetheless used very different practices, processes, and structures from those envisioned by either the facilitators or the participants. The whole of #rhizo14 was not simply greater than the sum of its part/icipants. Think of a conscious mind emerging from the orchestrated firings of a cluster of neurons.

Emergence is not commonly associated with traditional college courses, or even most MOOCs, which are largely crafted toward specific learning objectives and practices that are constructed before the student ever arrives. To use terms from Deleuze and Guattari (1987), the traditional student task is to *trace* a given course, not to *map* an open terrain. When a large, mostly virtual space is opened

for a class to emerge, we move to a different dimension from the traditional course, and we "encounter something else altogether," not just "something greater or more" (Goodenough & Deacon, 2006, p. 854).

The #rhizo14 course was not constructed; it emerged. It was not merely a MOOC, it was (and remains) something else altogether. We could call it an rMOOC. We do call #rhizo14 a course "out of habit, purely out of habit … because it's nice to talk like everybody else, to say the sun rises, when everybody knows it's only a manner of speaking" (Deleuze and Guattari, 1987, p. 3). The course has (we use the present tense because in important ways #rhizo14 continues[1]) almost no curriculum, instructor, set readings, or exercises, and no assessments. It had given starting and ending dates (January 14 – February 18, 2014) and an online location (P2PU), but these were merely starting points as it quickly deterritorialized and reterritorialized on Twitter, many blogs, Facebook, Google+, Google Hangouts, hallway conversations, conference presentations, and classroom assignments. Ultimately, as a subset of the #rhizo14 participants[2], we arrived at this document describing our experiences of #rhizo14.

Rhizomatic learning is not easily or concisely defined, but we must try. In a post entitled "Trying to write Rhizomatic Learning in 300 words," Cormier (2012b) states:

> The idea is to think of a classroom/community/network as an ecosystem in which each person is spreading their own understanding with the pieces … available in that ecosystem. The public negotiation of that 'acquisition' (through content creation, sharing) provides a contextual curriculum to remix back into the existing research/thoughts/ideas in a given field. Their own rhizomatic learning experience becomes more curriculum for others.

[1] At the original writing of this article in late 2014, #rhizo15 had not yet existed. At the time of reviewing this article in early 2016, all of us had participated in some form or another in #rhizo15. When we speak of #rhizo14 continuing in this article, the story of how it evolved and merged into #rhizo15 but still remained something different from it is missing. This is something we may wish to explore in the future: How different iterations of MOOCs affect community, and what it means to name MOOCs by a year-specific hashtag or not.

[2] How do you count the number of participants in a cMOOC? Those who signed up? Those who blogged once? Those who participated in some form or another (Twitter, facebook, Google+) throughout? Those who watched from afar? We therefore do not include a number. Nor do we count how many of "us" remained in the community beyond the authors here, because that number seems fluid; also, as several citations show, different people are doing different research and collaborations based on #rhizo14.

Rhizomatic learning, then, is non goal-based learning; it is learning focused *not* on students tracing the teacher's lesson plans, but on students performing: ripping, remixing, and feeding content back into the course for others to manipulate. Teacher and student roles are radically restructured. Course content and value come mostly from students, not the teacher, who, at best, is a curator providing a starting point and guidance, participating sometimes as a learner him/herself.

Still, we are left with the perplexing problem of explaining #rhizo14 to others without the benefit of traditional processes, practices, roles, or structures. A collaborative autoethnography (CAE) affords insight into what many participants found to be a most engaging course and what for some was a transformative experience (see Mackness & Bell, 2015, and Mackness, Bell, & Funes 2016, for a different perspective). In this paper, we highlight positive learner experiences that expand the discussion about MOOCs in general, cMOOCs more particularly, and #rhizo14 specifically. As #rhizo14 is ever-evolving, this paper represents only a snapshot of the moment in time in which it was written. (Honeychurch et al., this issue, and Hamon et al., 2015, are snapshots of other times when some of the authors of this article collaborated with others from #rhizo14).

LITERATURE REVIEW

One of the main purposes of this article is to explain in our own words the exhilaration we felt while participating in rhizomatic experiences, rather than have others speak for us (Bali & Sharma, 2015). Cormier (2012b, 2014) describes his rhizomatic courses as an attempt to deal with the "uncertainty of abundance and choice presented by the Internet." This poststructural approach to knowledge leads to facilitating learning experiences based on the belief that the "community is the curriculum" (2008, 2014). Hamon (2014) clarifies that in #rhizo14 we define concepts from the inside out, not from the outside in: i.e., we create a meaningful structure and share it among ourselves. In order to participate in this type of experience, learners need a high level of digital confidence (Kop, 2011; Brennan, 2013; Milligan, Littlejohn, & Margaryan, 2013; Waite, Mackness, Roberts, & Lovegrove, 2013). cMOOCs generally entail participant interaction on multiple platforms simultaneously (Mackness, Mak, and Williams, 2010), and this pattern was particularly true of #rhizo14.

The literature has established the need for active engagement of participants in cMOOCs (McAuley, Stewart, Siemens, & Cormier, 2010; Milligan et al., 2013; Waite et al., 2013; Kop, 2011), and has shown that participating in cMOOCs requires a high sense of one's own self-efficacy and autonomy (Brennan, 2013; Tschofen & Mackness, 2012; Downes, 2010; Mackness et al., 2010). Ultimately the requirements for self-efficacy and autonomy dictate that this type of experience is not for everyone. Possible reasons include:

1. a dislike of the community aspects of the experience (Mackness & Bell, 2015),
2. a lack of skills necessary to perform as autonomous learners (Mackness et al, 2010), or
3. various access issues (Bali & Honeychurch, 2014).

However, many #rhizo14 participants welcomed the diversity of the community, and the genuine attempts made by the facilitator and other participants to foster full inclusion (Bali & Sharma, 2014).

RESEARCH METHODOLOGY

We chose to conduct CAE research out of a collective desire to represent complex learner experiences in a concrete and comprehensible manner, rather than in an abstract and generalized way. The ethical drive behind this decision stems from a desire to have our own voices represented, to tell our own stories, rather than have others narrate on our behalf. Some of us are postcolonial non-Anglo educators, or have been disempowered in our lives for other reasons; we do not wish the stories of our experiences to be told only by others. We conclude that representing non-dominant, non-traditional voices requires a non-traditional participatory research approach

Autoethnographic research is an interpretive/critical research tradition which "challenges the hegemony of objectivity or the artificial distancing of self from one's research subjects" (Chang, Ngunjiri, & Hernandez, 2013, p. 18) and eschews positivist standards of validity and rigor.

CAE is a process in which individual write narratives that are then collectively revisited, analyzed, and related to the literature by the same individuals who wrote them (Geist-Martin, et al., 2010). In our case, a group of us who were interested in conducting participatory research on our experiences in #rhizo14 started a Google document and invited everyone in the course (via Facebook and Twitter) to participate by adding their narratives. People were free either to write a freeflowing narrative, link to particular blogposts already written, or answer some questions some of the initiators of this project had written. We received over 30 narratives, with some participants commenting on the margins of each other's narratives. After a long struggle with how to convert these narratives into a publishable paper, some of us persisted in trying to make it work (see Hamon et al, 2015 for the backstory). Eventually, we realized that:

1. it is impractical to write an article with 30 authors;
2. not all 30 narrative-writers wished to continue doing the research; and
3. it would not be participatory research if some of us wrote the article using other people's narratives and analyzed them on their behalf.

Instead, we have chosen to write papers focusing only on the narratives of each article's author (this is a dynamic group and changes slightly per project/paper/conference). Whoever is interested in participating in a particular article or other output becomes a researcher-participant in that article, and narratives are collaboratively analyzed (and sometimes extended) using whatever angle is chosen for that piece. To do otherwise--to analyze the stories of people who are not participating in the authoring--would lose the "auto" dimension of autoethnography.

CAE research is not yet widespread in the field of MOOCs, but has been conducted on MOOCs previously (e.g. Bali, Crawford, Jessen, Signorelli, Zamora, 2015 conducted it comparing different cMOOCs while Bentley, Crump, Cuffe, Gniadek, Jamieson, MacNeill, & Mor, 2014, focused on one MOOC). Our research fills a gap; to date, little has been written on in-depth analysis of learner experiences in cMOOCs. Our work here also expands the literature on the #rhizo14 course, in particular. In addition, CAE seems an appropriate methodology for studying a postmodern notion such as rhizomes; we "must redefine rigor (and find practicable alternatives to rigor) for the connected learning environment" (Morris, Rorabaugh, & Stommel, 2013).

Autoethnography "seeks to describe and systematically analyze personal experience in order to understand cultural experience" (Ellis, Adams, & Bochner, 2011). The goal is to help readers "keep in their minds and feel in their bodies the complexities of concrete moments of lived experience" (Ellis, 2004, p.30 quoted in Geist-Martin, Gates, Weiring, Kirby, Houston, Lilly, & Moreno, 2010). Practiced collaboratively, autoethnography serves to "illustrate how a community manifests particular social/cultural issues" (Ellis et al., 2011). All research is inherently interpretation and therefore subjective (Nixon, 2012). All we can do as researchers is be honest about the limitations of our points of view as individuals and collaborate to question our individual and collective interpretations and conclusions.

Unfortunately, CAE creates the risk of premature consensus-building and multivocality (Chang et al., 2013). Therefore, our measures of quality include researcher reflexivity: a thick, rich description of context that allows readers to judge transferability to their own purposes. Rather than generalizability sought by

positivist research, we seek the crystallization[3] afforded by focusing multiple lenses on the social phenomenon being studied to show divergent possibilities. We hope to provide a research narrative that moves beyond triangulation and instead seeks divergence. We also recognize that by focusing on a subset of participants in #rhizo14,we produce research that is partial (but all research is partial; there will almost always be only a subset of participants and a particular moment in time being studied, however long). As Wolcott says of ethnography, no research is fully inclusive; rather, "each of us who does it is *someone*, not *everyone* at once" [emphasis in original] (2010, p. 75). Moreover, CAE captures the responses of participants at a moment in time, making utterances in response to researcher questions. In writing this article, we researchers have ourselves been the participants and authors); , we have collaboratively edited some parts of our narratives for clarity and to fill some gaps, going beyond the moment in time captured by our initial narratives as we wrote this article. Finally, beyond our IRB approval from the American University in Cairo[4], we remain conscious of how references to individuals outside this CAE could pose ethical problems (Ellis & Bochner, 2000), and so have sought to minimize details about others; however, others were part of our experience and cannot be removed completely from our narratives.

In analyzing our data, we realised that it was important to find themes that help tell our stories (Ellis & Bochner, 2000). Therefore, we have worked to identify similarities and differences among our narratives and have written about these themes in ways that highlight key aspects of our learner experience in #rhizo14.

FINDINGS

As the authors, we represent a subset of #rhizo14ers that we deem sufficiently diverse to offer multiple angles and perspectives, although we all have one thing in common: We remained active in #rhizo14 for months beyond the course, and continued to collaborate in various ways. We are from Canada (Scott is American living in Canada, and Rebecca is Canadian living in the U.S.), Egypt (Maha),

[3] Looking at social research as a "crystal" is a notion Laurel Richardson (1997) proposes as a transgressive, post-modern view of social research validity, such that an object looks different from different angles, and the researcher can look at phenomena from each angle, shedding light on different views while recognizing the simultaneous existence of multiple alternate views. According to Richardson, "crystallization provides us with a deepened, complex, thoroughly partial understanding... Paradoxically, we know more and doubt what we know" (p. 94). Crystalization is radically different from triangulation which attempts to converge toward one conclusion.

[4] Maha Bali sought approval from the IRB office of the America University of Cairo because that university requires faculty members to obtain IRB approval for any research to be published. The institutions of the other authors did not require IRB approval for autoethnographic research.

Guyana (Lenandlar, hereafter referred to by his nickname, Len), Netherlands (Ronald, hereafter referred to as Ron), Scotland (Sarah), and the United States (Keith and Apostolos, hereafter nicknamed AK as he prefers to be called). We are a mix of educators working in different sectors of higher education, some of us PhD students, others professors/lecturers. Some of us were experienced cMOOCers, some first-timers. We had different motivations for joining, different attitudes towards the course, and different approaches to engaging with the course, but similar reasons for staying with the community and valuing the learning experience. Given the richness of our experiences, we cannot capture all that we have learned in one article, and so we have chosen to focus on some broad questions.

WHAT LED US TO #RHIZO14?

Some of us joined #rhizo14 after a long-standing engagement with the ideas of rhizomatic learning or previous interaction with the course creator, Dave Cormier. Others were curious about but still relatively new to the idea of rhizomatic learning. Len and AK had encountered rhizomatic learning in previous cMOOCs, and wanted to engage more deeply. Keith had had the deepest engagement with rhizomatic learning prior to #rhizo14:

> Dave and I have been discussing rhizomatic education and the ideas of Deleuze and Guattari ever since we met online, we have followed each other's blogs and gathered from time-to-time. I have always admired his thinking and found deep resonance between his ideas and my own. His ideas make mine better, and I think mine contribute to his. More specifically, I like that he is able to convert his ideas into real-world courses much better than I, so I wanted to see what he was doing with this MOOC.

Maha and Sarah were relatively new to cMOOCs. Sarah had previously engaged deeply with Deleuze's and Guattari's ideas, but it was her first cMOOC. Maha had engaged briefly with the idea of rhizomatic learning via Cormier's blog. Rebecca (a cMOOC veteran) had heard about #rhizo14 at a conference.

WHY DID WE PERSIST IN #RHIZO14?

It is important to examine learners' approaches to engaging with a cMOOC because connectivist approaches to learning require a high degree of autonomy, flexibility, and technological skill (Mackness et al., 2010). Abstract attempts to describe connectivism do not explain to an outsider how learning occurs in connectivist settings. Participation in #rhizo14 was distributed across different online platforms, making it unfeasible to keep track of all the conversations. Len says:

> I believe in helping to organise things, locate stuff, share, help people with technology stuff... partly I join to help out wherever I think I can because I love to and because I learn a lot by doing so and because these MOOCs allow you to be you. You can become the self-appointed facilitator.

Some (including Scott and AK) blogged themselves, but also emphasized the importance of responding to other people's blogs. Scott said "After years of MOOCs I still feel a stronger urge to respond to people at blogs or Facebook entries than to blog myself." Others (e.g., Maha) felt that their own blogging was important for integrating knowledge and ideas of self and others. Keith said "I, of course, took great value from the MOOC, and I think I was able to add value" through blogging and responding.

Several of us found Facebook the main hub, while others did not. For some (e.g., Sarah and Keith) the weekly synchronous (un)hangouts were a major part of their experience, whereas for others (e.g., Scott and Maha) the asynchronous component was more important. For some, such as AK, the synchronous and asynchronous were equally important. Keith commented on the feeling that he was always missing something. A veteran cMOOCer, he knows it is not possible to keep track of everything happening in a cMOOC:

> I always feel as if I missed the most important part. This is especially stressing to good students ... and it has been one of the most difficult things for me to accommodate. I want to know it all, and I tend to get stressed when I so obviously don't.

AK says that he eventually reduced the number of platforms he was tracking to the most active (mainly Facebook). One theme running through the narratives included in this CAE involves an emphasis participants placed on responding to other people's blogs or Facebook posts: on connecting as an end in itself.

The content-lightness of the course (virtually no assigned readings, very brief prompt, and very brief video) enabled participants to focus on connecting and creating their *own* content. It is also noteworthy that other publications (Hamon et al, 2015, Hogue et al, 2015) mention participants who engaged in creative activities with a variety of media, including multimedia and poetry. All of these types of engagement were participant-initiated. Other cMOOCs (Bali et al., 2015) often have more facilitator-led content and activities.

Although we co-authors feel a strong sense of community within #rhizo14, we recognize that some feel differently (see Mackness & Bell, 2015) and some participants, as with any MOOC, did not continue beyond the first two weeks. Not all of us felt immediately included or always included in #rhizo14. We recognize how some people's experiences of community may make others feel excluded. Both Maha and Sarah (cMOOC newbies) had initial concerns that previously-existing cliques might exclude them, but they both quickly felt part of

#rhizo14, and eventually, Sarah says, “I felt very much part of the rhizo14 community, worried though that we might be excluding others by some of us shouting so loud. I still worry about that.” Conversely, Rebecca felt like an outsider

> because I’m not a post modern / post structuralist researcher, nor really a constructivist / critical theory type researcher. However, I see a place in the world for multiple perspectives - and for that reason, and honestly, the awesomeness of the people in a cMOOC - I found myself drawn to be part of rhizo. I mostly lurked, but was really happy to see the Facebook group so active. I did, and I still do, feel drawn to the community.

As AK correctly points out, inclusion depends on how we define or perceive it.

> I think that the experience in #rhizo14 has been quite inclusive... There were no trolls in #rhizo14, that I could see anyway, and a sufficient amount of peers responded to my posts. I hope that I also responded to a satisfactory amount of their posts. This enabled a feeling of inclusion and continuation of the discussion so learning, and further understanding, could continue to take place.

Keith felt included even though he knew he was not involved in the discourse occurring in all of #rhizo14’s spaces:

> I felt no sense of exclusion from the community at all. The exclusion I felt was from my inability to join all the conversations that I wanted. For instance, I was excluded from the Facebook conversation mostly because I don’t use Facebook much and I just didn’t have time to get to it, being too engaged in blog posts and Google+. That exclusion is real—I was not present in those conversations—but it is not what people usually mean by exclusion as some intentional effort to keep some people out of a conversation or space. I had no sense of that kind of exclusion at work in #rhizo14; still, Mackness (2014) makes a wonderful point that exclusion happens despite our best intentions and best efforts to avoid it.

Ron perceived that “inclusion was wonderful in this MOOC. Inclusiveness, I translate it into ‘willingness to include others in my learning, willingness to take care of the learning of my peers.’ Including others needs one to open up to others.” He believes that the hierarchies we face in real life make us much less open to making ourselves vulnerable. This suggests that (for Ron, at least) part of the value of #rhizo14 involves the separation of the course and community experience from the (hierarchy-laden) experiences of daily life. Scott, however, says he “Occasionally feel[s] unqualified to be here” because of experiences in his life in which he felt unappreciated, excluded by his lack of formal qualifications.

> My response to #rhizo14 and cMOOCs in general was a feeling of release from being judged, ignored and disrespected over the last 8 years. I find the inclusiveness of #rhizo14 to be quite liberating.

Maha refers to events that occurred in week two when there was some tension (within #rhizo14) and how the community responded supportively and helped her "zone out" of troubling events in Egypt. (See also Honeychurch et al., this issue).

Cormier often referred to #rhizo14 as a 'party,' but Ron believes the metaphor of a 'pot luck' might be more suitable, since, in the pot luck format, each person brings something different to share at the table.

So far we have discussed our feelings and perceptions about #rhizo14 and how we chose to participate, but have not addressed specifically what we learned in this "course" or learning experience with no pre-determined learning objectives, so we turn to this next.

WHAT DID WE LEARN IN #RHIZO14?

We all noticed that we were expected to be self-directed learners, setting our own goals and learning path - all we had for guidance was a 'trickster,' the term #rhizo14 only half-facetiously applied to Cormier and his habit of starting each week with a tricky prompt such as: "Is books making us stupid?" (See Honeychurch et al., this issue, for a full list of weekly topics.). It was up to the participants to co-create all other elements of the curriculum.

AK indicates that his initial metric of success prior to beginning #rhizo14 was "the number of meaningful connections I've made with others that allow me to continue learning after the course is done" and "how much the course, and my peers, have stretched me to think outside of the box," all of which has happened for him in #rhizo14. It is still hard for AK to measure what learning success means, or meant, in #rhizo14 and it seems to him that success is the continued interaction with the topic and the community.

For Keith, #rhizo14 was "as rewarding as education gets"; he suggests cMOOCs are "among the most profound of all my formal educational experiences" because interaction within them has potential to "expand your view of reality" which he calls a "genius force." Keith feels that the great value of #rhizo14 derived from others' participation, as as facilitated through the rhizomatic approach:

> I think that in most traditional classes only the teacher is expected to add value. The students are stuck receiving [what the teacher chooses to offer], and that always becomes deadening, even if the teacher's value-add[ed] is high.

This has proven one of his strongest bonds, especially in the year since the formal close of the course, and it is perhaps one of the strongest benefits of rhizomatic,

community-based education, as a community can sustain engagement far longer than even the most gifted instructor can do. A community is richer than any curriculum.

Others in our collective also experienced this fading away of the teacher/facilitator. Maha, for instance, says, "I felt supported by the community (Dave, too, but the community became more important than Dave here)."

There were some unexpected side benefits from #rhizo14. Maha wrote that it had been "both my escape from reality, and my support network for my real life thoughts, problems (e.g., my 2-in-1 course dilemma), and a place to echo thoughts with people I trusted on all things from parenting to #FutureEd to the Arab MOOC."

The reader will likely be unfamiliar with much of what Maha is referring to above. But #rhizo14 participants knew about the course dilemma she was facing in her face-to-face teaching context, the #FutureEd MOOC which several members of #rhizo14 were participating in and discussing amongst themselves in the #rhizo14 Facebook group, and Maha's blogging about the then-new Arab MOOC platform. The #rhizo14 cMOOC helped Maha think through these interesting developments and discuss her learning with peers.

Several of us learned how to learn rhizomatically, make ourselves vulnerable, discuss our more radical/dissenting views, and learn from others' blog posts and interaction rather than books; we also all learned to conduct CAE, a research methodology new to us. And, while Sarah "didn't get to talk as much about Deleuze and Guattari as I thought I might,...it didn't really matter." She found ways to have those discussions elsewhere. Ron discovered aspects of rhizomatic learning that involve education that functions without a social contract. He writes:

> I ... did expect the organizer of Rhizo14 to play at least some kind of facilitating role. To me he fulfilled this role by starting every week of Rhizo14 with a very short introduction to get discussions going.
>
> We ... all had some kind of responsibilities, e.g., to stay polite and constructive in the discussions and to put in our own time. Since in Rhizo14 the participants shaped the curriculum into what it finally became, this responsibility felt authentic and motivating.

WHY HAS #RHIZO14 CONTINUED?

Sarah describes #rhizo14, which has become an essential part of some of our lives, in terms of tribal affiliation:

> I've made so many friends through this experience ... I've found my tribe here ... I engage with it because I've found a bunch of folk who are interested in similar things to me, they post interesting things... lively, intelligent, generous ... I can't imagine life without them now.

Maha attributes part of this to the daily contact: "Strangely, we assume building community [face-to-face] is easier, but it is less intense if you meet once a week than if you are online daily!" Maha continues:

> Rhizo14 saved me. It was my escape at a very hard time in my life on so many levels. I often escape with my scholarship and online communities, but none has been as close-knit (strange metaphor given how widespread we physically are) as rhizo14.

Many of us here are dissenters in our own contexts. In fact, Scott feels this is what connects us: "My sense is all of us in Rhizo14 don't really have allegiances beyond a tight connection to being human and not someone's stooge."

Specific undertakings such as this CAE and Hamon et al (2015) have supported the continuous engagement of our sub-group of #rhizo14 participants, our "collective," and enabled us to deepen our relationships with each other.

Working on this CAE has involved us all in hours of blogging, co-authoring proposals for conferences (e.g. Hogue et al., 2015) and journals, brainstorming, and working through process and progress in a variety of work spaces—creating and maintaining a network of thought and action. We have also actively sought other MOOCs-of-interest in which to participate together.

DISCUSSION

"We murder to dissect" —William Wordsworth

This quote describes our feelings as we prepared to dissect our narratives in order to write a 6,000-word article. Some of the life of this corpus has been lost in the process of preparing it, and it was torturous to remove some of the richness of the narratives; however, writing and examining this CAE has clarified our own thinking. Perhaps our major finding from the experience is that the community can, indeed, be the curriculum: i.e., rhizomatic learning can lead to exciting, engaging, even transformative learning experiences.

We also must acknowledge that some participants found it a negative experience (Mackness & Bell, 2015). In their exploration of CCK08, Mak et al. (2010), highlight personality clashes and barriers to participation such as people who exhibit appalling behavior, or who are patronizing and contribute "teachery" posts to the conversations. We are aware of contention within the #rhizo14 community, as well. We do not address the shadowy side here since to do so would be to speak in voices that are not part of this autoethnography. We very much recognize that more study needs to be done to bring the shadows into the light, to use the terms in which Mackness & Bell have framed the process of revealing this hidden data.

We are impressed that such a large community can emerge and function as a rhizomatic learning space, and for us #rhizo14 was rhizomatic. While

familiarity with Deleuze and Guattari's rhizome metaphor is not necessary to appreciate #rhizo14, their ideas can clarify certain observable dynamics. Deleuze and Guattari (1987) point out that the rhizome is a map with "multiple entryways, as opposed to the tracing, which always comes back 'to the same'" (p. 12); likewise, we entered #rhizo14 from multiple entryways and for many reasons, and our trajectories through the course varied wildly at times, especially as the course moved beyond its initial online space and planned time.

Deleuze and Guattari also note that the rhizome has principles of connectivity and heterogeneity: "any point of a rhizome can be connected to anything other, and must be" (1987, p. 7). Traditional classes trace most connections and interactions through the teacher and along explicit curricular pathways. A rhizomatic learning space does not. Rather, the community quickly learns to rely on itself and becomes self-organizing, a necessary condition for emergence. As in an underwater reef, we coalesced around certain coral heads and grassy spots — different blogs, Facebook discussions, and Twitter chats — and we were free to move from one to the other as our interests led us. Rather quickly, a community formed with sub-groups. Some learners stayed close to a single sub-group, others moved from group to group. Lurkers, those who watch a MOOC unfold but who do not actively participate, formed the largest group. Almost nothing is said about them in research, and this is a serious gap, for they may take and provide far more value in rhizomatic learning spaces than we suspect. Like the crowd at a sporting event, they take the game into their homes, offices, and workplaces the next day, propagating the heat of the on-field action through their extended social networks. As with all MOOCs, there were also participants who dropped out after one or two weeks; they are not represented in this paper, but are mentioned by Mackness and Bell (2015), who are commendable for making the effort to reach them and include them in their research.

Content, format, and people attracted us to #rhizo14, but this suggests more consistency than existed. While some of us joined #rhizo14 because we knew Dave Cormier, others joined because of someone else or something else. Some of us came for a discussion of Deleuze and Guattari, but others of us resisted talking about obscure French writers. Some wanted to know how to build a MOOC, build a curriculum out of a community, or understand connectivism better. Our cMOOC, #rhizo14, accommodated all these trajectories and kept the conversations going for those of us who found them engaging. The question we cannot currently answer is how a conversation can emerge and be sustained for more than a year without a sponsoring organization, a teacher, or a curriculum.

Part of the answer, though, surely has to do with a shared literacy built around technology, content, and language. We (those who completed #rhizo14 and continued to collaborate beyond #rhizo14) had the digital literacy to learn via

a cMOOC, the open attitude to work around each other's strengths and interests, and the abilities to conduct collaborative research remotely. We also had the resilience to continue trying to publish and present our work, despite many audiences' not understanding what we were proposing to describe or do; the flexibility to work with different team members on different projects; and a common interest in education. We also shared a reasonable facility with English, though it was not everyone's native language. A shared language may seem a given, but in rhizomatic learning spaces, we should not assume a language is shared equally among all as Bali and Sharma (2014) explore in their article about minority voices in shared spaces. This point should not be underestimated because, although rhizomatic learning space intends to be open and accommodating to any and all, it seems clear that shared literacy is a benefit afforded to some and denied to others. A rhizomatic learning space has a tension between rhizomatic multiplicity, on one hand, and shared literacies, on the other. This tension is problematic for all and discouraging for many.

We also stayed in #rhizo14 because of the variety of ways to engage in learning with each other. Some of us focused on original production in blog and Facebook posts, while others mostly responded with comments on others' posts, and yet others exhibited, curated, aggregated, and organized contributions to the course. We not only looked for value in the course, but we provided and continue to provide value, making the course something more than what it would have been had we not engaged in it. We embodied the core tenets of the cMOOC: aggregation, remixing, repurposing, and feeding forward (Downes, Siemens, & Cormier, 2011).

Finally, we better understand how we might begin to incorporate rhizomatic learning into more traditional, formal university courses, an issue that has intrigued many of us throughout #rhizo14. Cormier (2012a) suggests that rhizomatic learning is most suitable for open-ended explorations of the complex domain, a concept he borrows from Snowden's Cynefin framework for organizational decision making (Snowden, 2000). Succinctly put, Snowden suggests that in educational terms, instruction in the simple domain assumes one right answer with one or few pathways to that answer, or shorter yet: best practice. Instruction in the complex domain assumes many answers with many pathways to that answer. Rhizomatic learning is best suited for the complex domain, one that many assume is best reserved for more experienced, expert learners. Some of us, however, believe that the complex domain is appropriate for all learners regardless of age or expertise. Clearly, we need more research and thought here.

CONCLUSION

Rhizomatic learning alone is not for all teaching situations. Rhizomatic learning assumes the complexity of a diverse, self-organizing community that functions on continuous feedback and feedforward towards clarity, with or without conclusions or even consensus. It is open and global, but not yet all-inclusive, especially in a virtual space that smudges cultural boundaries.

Bali and Sharma suggest that #rhizo14 strives towards inclusive learning well:

> Full inclusion may be an impossible goal, not just across sociocultural and geopolitical borders but also within those borders. However, educators can and should strive for genuine attempts toward inclusion by not assuming the local to be universal, by inviting colleagues and other learners to participate on their own terms, and by developing a high sense of tolerance and openness about difference. (2014)

In this paper, we have presented key themes that outline our experiences in #rhizo14. Although the written medium can only elucidate a small portion of our learning, writing the paper itself has reinforced our belief in the power of our collaboration. For us, #rhizo14 provides a positive and transformative lifelong learning experience and has demonstrated that the community can indeed be the curriculum.

REFERENCES

Bali, M., Crawford, M., Jessen, R., Signorelli, P., & Zamora, M. (2015). What Makes a cMOOC Community Endure? Multiple Participant Perspectives from Diverse cMOOCs. *Educational Media International.* 52:2, pp. 110-115. doi: 10.1080/09523987.2015.1053290

Bali, M., & Honeychurch, S. (2014). Key pedagogic thinkers - Dave Cormier. J*ournal of Pedagogic Development* 4, 3 November 2014. Retrieved from: http://www.beds.ac.uk/jpd/

Bali, M., & Sharma, S. (2014). Bonds of difference: Participation as inclusion. Retrieved from: http://www.hybridpedagogy.com/

Bentley, P., Crump, H., Cuffe, P., Gniadek, I., Jamieson, B., MacNeill, S., & Mor, Y. (2014). Signals of Success and Self-directed Learning in *Proceedings of the European MOOC Stakeholder Summit 2014.* Retrieved from: http://www.emoocs2014.eu/sites/default/files/Proceedings-Moocs-Summit-2014.pdf

Brennan, K. (2013). In connectivism, no one can hear you scream: A guide to understanding the MOOC novice. *Hybrid Pedagogy.* Retrieved from: http://www.hybridpedagogy.com/

Chang, H., Ngunjiri, F. W., & Hernandez, K.-A. C. (2013). *Collaborative autoethnography*. Walnut Creek: LeftCoast Press

Cormier, D. (2008, June 03). *Rhizomatic education: Community as curriculum*. [web log post] Retrieved from: http://davecormier.com/edblog/2008/06/03/rhizomatic-education-community-as-curriculum/

Cormier, D. (2012a, March 04). *Seeing rhizomatic learning and MOOCs through the lens of the Cynefin framework*. [web log post] Retrieved from: http://davecormier.com/edblog/2012/03/04/seeing-rhizomatic-learning-and-moocs-through-the-lens-of-the-cynefin-framework/

Cormier, D. (2012b, December 13). *Trying to write rhizomatic learning in 300 words*. [web log post] Retrieved from: http://davecormier.com/edblog/2012/12/13/trying-to-write-rhizomatic-learning-in-300-words/

Cormier, D. (2014). *Rhizomatic learning - the community is the curriculum*. Retrieved from: https://p2pu.org/en/courses/882/rhizomatic-learning-the-community-is-the-curriculum/

Deleuze, G., & Guattari, F. (1987). *A thousand plateaus: Capitalism and schizophrenia*. (B. Massumi, trans.). Minneapolis, MN: University of Minnesota Press.

Downes, S. (2010, October 10). *What is democracy in education?* [web log post] Retrieved from http://halfanhour.blogspot.com/2010/10/what-is-democracy-in-education.html

Downes, S., Siemens, G., & Cormier, D. (2011). *How this course works.* Retrieved from: http://change.mooc.ca/how.htm

Ellis, C., Adams, T. E., & Bochner, A. P. (2010). Autoethnography: An overview. *Forum Qualitative Sozialforschung / Forum: Qualitative Social Research*, 12(1). Retrieved from: http://nbn-resolving.de/urn:nbn:de:0114-fqs1101108

Ellis, C., & Bochner, A. P. (2000). Autoethnography, reflexivity and narrative. In N. K. Denzin & Y. S. Lincoln (eds). *Handbook of qualitative research, 2nd Ed.*

Fini, A. (2009). The technological dimension of a massive open online course: The case of the CCK08 course tools. *International Review of Research in Open and Distance Learning*. 10(5). Retrieved from: http://www.irrodl.org/index.php/irrodl/article/view/643

Geist-Martin, P., Gates, L., Weiring, L.M., Kirby, E., Houston, R., Lilly, A., & Moreno, J. (2010). Exemplifying collaborative autoethnographic practice via shared stories of mothering. *Journal of Research Practice*. 6(1). Retrieved from: http://jrp.icaap.org/%20index.php/jrp/article/view/209/187

Goodenough, U., & Deacon, T. W. (2006). The sacred emergence of nature. In P. Clayton (Ed.), *The Oxford handbook of religion and science* (pp. 851-871). Oxford, UK: Oxford University Press.

Hamon, K. (2014, January 18). A more practical view of the rhizome for #rhizo14. [web log post]. Retrieved from: http://idst-2215.blogspot.co.uk/2014/01/a-more-practical-view-of-rhizome-for.html

Hamon, K., Hogue, R. J., Honeychurch, S., Johnson, S., Koutropoulos, A., Ensor, S., Sinfield, S., & Bali, M. (2015, June 4). Writing the unreadable untext: A collaborative autoethnography of #rhizo14. *Hybrid Pedagogy*. Retrieved from: http://www.hybridpedagogy.com/

Hogue, R., Bali, M., Singh, L., Koutropoulos, A., Honeychurch, S., Ensor, S., Elliott, T., Hamon, K., Vaile, V., Sinfield, S. (2015). #Rhizo14 Collaborative Autoethnography: Challenges and Joys of Unwriting the Untext. Presented as a Discovery Session via VoiceThread at the *Emerging Technologies for Online Learning Symposium*, Dallas, Texas.

Kop, R. (2011). The challenges to connectivist learning on open online networks: Learning experience during a massive open online course. *International Review of Research in Open and Distance Learning*. 12(3). Retrieved from: http://www.irrodl.org/index.php/irrodl/article/view/882

McAuley, A., Stewart, B., Siemens, G., & Cormier, D. (2010). *The MOOC model for digital practice.* Retrieved from: http://www.elearnspace.org/Articles/MOOC_Final.pdf

Mackness, J. (2014, January 26). *The messiness of rhizomatic learning – Words steal my intent.* [web log post] Retrieved from: https://jennymackness.wordpress.com/2014/01/26/the-messiness-of-rhizomatic-learning-words-steal-my-intent/

Mackness, J., Mak, S.F.K., & Williams, R. (2010). The ideas and reality of participating in a MOOC. *Proceedings of the 7th International Conference on Networked Learning*. Retrieved from: http://eprints.port.ac.uk/5605/1/The_Ideals_and_Realilty_of_ Participating_in_a_MOOC.pdf

Mackness, J., & Bell, F. (2015). Rhizo14: A rhizomatic learning cMOOC in sunlight and in shade. *Open Praxis*, *7*(1), 25–38. http://dx.doi.org/10.5944/openpraxis.7.1.173

Mak, S..J, Williams, R., & Mackness, J. (2010). Blogs and forums as communication and learning tools in a MOOC. P*roceedings of the 7th International Conference on Networked Learning*. Retrieved from: http://www.lancaster.ac.uk/fss/organisations/netlc/past/nlc2010/abstracts/PDFs/Mak.pdf

Mathews, B. (2015, Jan 12). Millions of sources: The disruption of history and the humanities? *The Chronicle of Higher Education.* Retrieved from: http://chronicle.com/blognetwork/theubiquitouslibrarian/2015/01/12/millions-of-sources-the-disruption-of-history-and-the-humanities/

Milligan, C., Littlejohn, A., & Margaryan, A. (2013). Patterns of engagement in connectivist MOOCs. *MEOT Journal of Online Learning and Teaching, 9*(2),149-159. Retrieved from: http://jolt.merlot.org/

Morris, S. M., Rorabaugh, P., & Stommel, J. (2013, October 9). Beyond rigor. *Hybrid Pedagogy.* Retrieved from http://www.hybridpedagogy.com

Nixon, J. (2012). *Interpretive pedagogies for higher education: Arendt, Berger, Said, Nussbaum and their legacies.* London and New York: Bloomsbury.

Richardson, L. (1997). *Fields of Play: Constructing an Academic Life*. New Brunswick, New Jersey: Rutgers University Press.

Snowden, D. (2000). Cynefin, a sense of time and place: An ecological approach to sense making and learning in formal and informal communities. Retrieved from: http://citeseerx.ist.psu.edu/viewdoc/summary?doi=10.1.1.196.3058

Tschofen, C., & Mackness, J. (2012). Connectivism and dimensions of individual experience. *International Review of Research in Open and Distance Learning*. Retrieved from: http://www.irrodl.org/index.php/irrodl/article/view/1143/2086

Waite, M., Mackness, J., Roberts, G., & Lovegrove, E. (2013). Liminal participants and skilled orienteers: Learner participation in a MOOC for new lecturers. *Journal of Online Teaching and Learning*. 9(2). Retrieved from: http://jolt.merlot.org/vol9no2/waite_0613.htm

Wolcott, H.F. (2010). *Ethnographic lessons: A primer*. Walnut Creek, CA: Left Coast Press.

Correspondence concerning this article should be addressed to Maha Bali, Center for Learning and Teaching, American University in Cairo, Cairo, Egypt. bali@auegypt.edu

QUALITY MANAGEMENT OF LEARNING MANAGEMENT SYSTEMS: A USER EXPERIENCE PERSPECTIVE

Panagiotis Zaharias Open University of Cyprus
Christopher Pappas The eLearning Industry's Network

ABSTRACT

Learning Management Systems (LMS) have been the main vehicle for delivering and managing e-learning courses in educational, business, governmental and vocational learning settings. Since the mid-nineties there is a plethora of LMS in the market with a vast array of features. The increasing complexity of these platforms makes LMS evaluation a hard and demanding process that requires a lot of knowledge, time, and effort. Nearly 50% of respondents in recent surveys have indicated they seek to change their existing LMS primarily due to user experience issues. Yet the vast majority of the extant literature focuses only on LMS capabilities in relation to administration and management of teaching and learning processes. In this study the authors try to build a conceptual framework and evaluation model of LMS through the lens of User Experience (UX) research and practice, an epistemology that is quite important but currently neglected in the e-learning domain. They conducted an online survey with 446 learning professionals, and from the results, developed a new UX-oriented evaluation model with four dimensions: pragmatic quality, authentic learning, motivation and engagement, and autonomy and relatedness. Their discussion on findings includes some ideas for future research.

KEYWORDS: Learning management systems, User Centered Design, User Experience, Evaluation model.

QUALITY MANAGEMENT OF LEARNING MANAGEMENT SYSTEMS: A USER EXPERIENCE PERSPECTIVE

Panagiotis Zaharias[xii] Open University of Cyprus
Christopher Pappas[xiii] The eLearning Industry's Network

THROUGH USERS' EYES: EVALUATING LEARNING MANAGEMENT SYSTEMS

Since the early days of the rapid expansion of e-learning, the need for a virtual place that connects users (learners and instructors) with courses and a variety of learning content has become evident. Course Management Systems (CMS) and then Learning Management Systems (LMS) have been developed to address such a need. Added to the abundance of terms are Virtual Learning Environments (VLE) and, more recently, Personal Learning Environments (PLE). We, the authors, focus in this paper on Learning Management Systems: well-known software platforms for the administration, documentation, tracking, reporting, and delivery of e-learning education courses or training programs. According to Kurilovas (2009), LMSs are considered to be specific information systems that provide the possibility to create and use different learning scenarios and methods. Most of the definitions in the literature have been influenced by developments in the industry that emphasize the administrative capabilities of LMS. For instance, Alias and Zainuddin (2005) defined a learning management system (LMS) as "a software application or Web-based technology used to plan, implement, and assess a specific learning process" (p. 28) while Mohawk College (2009) suggested an "LMS can be broadly described as a web-accessible platform for the 'anytime' delivery, tracking and management of education and training." In most definitions and approaches, the focus is on the administration and management of the teaching and learning processes.

The evolution of LMSs was swift: Many vendors developed and offered their solutions in a rapidly growing market. There was huge interest by the educational institutions and the companies that wanted to invest in new learning technologies; consequently, adoption was widespread. Since there is a plethora of LMSs in the market and each LMS is a complex system that incorporates a vast array of features, the selection and evaluation of an LMS is a complex and demanding process that requires a lot of knowledge, time, and effort. Although there is some limited research work on the issue, it still remains an open and

multifaceted problem as the technology evolves over time along with the maturity of e-learning users. In this study, we try to investigate the issue of LMS evaluation through the lens of User Experience (UX) research and practice, which is quite important but also neglected in the e-learning domain. We propose a new UX-oriented evaluation model with four main dimensions. We expect that this model will help e-learning designers as well as usability and UX practitioners make an alternative evaluation of LMS platforms. Next sections present related work and describe the method of this study, including data analysis and results, followed by discussion and future research ideas.

RELATED WORK

The vast majority of the extant literature regarding LMSs relates to the issue of LMS adoption and acceptance. LMS evaluation to date has been examined from various perspectives, including those of administrators (Naveh, Tubin, & Pliskin, 2010), faculty members (Almarashdeh, Sahari, Zin, & Alsmadi, 2011) and learners/students (Naveh, Tubin, & Pliskin, 2012).

For instance, Al-Busaidi and Al-Shihi (2010) developed a theoretical framework for evaluating instructors' acceptance of LMSs based on the Technology Acceptance Model. They examined the main critical factors that influence the instructors' perception of ease of use and perception of the usefulness of LMSs. These factors focus on the instructors, organization, and technology:

- Instructor factors include attributes such as perceptions of self-efficacy, attitudes toward LMS, experience, teaching style, and personal innovativeness.
- Organization factors include motivators, technology alignment, organizational support, technical support, and training.
- Technology factors include system quality, information quality, and service quality.

Emelyanova and Voronina (2014) investigated stakeholders' perceptions of the LMS's convenience, effectiveness, and usefulness. These scholars emphasized the human factor perspective as they asserted that this is a vital prerequisite for the success of the LMS. They also highlighted that a lot of learners perceive that there is a problem with usability of LMSs. In addition they found that, for some students, the perceived ease of use of LMS does not necessarily imply its usefulness as a learning tool.

On the other hand, there are very few studies that have investigated the complex decision-making problem of evaluation and selection of an LMS. Focusing on this issue, Pipan et al. (2010) proposed the Evaluation Cycle Management (ECM) methodology. This methodology is based on two evaluation phases: a) multi-attribute decision making (criteria evaluation) and b) usability testing (usability evaluation).

Multi-attribute decision making refers to the development of a qualitative hierarchical decision model based on *Decision EXpert* (DEX), an expert system shell for multi-attribute decision support. The criteria for the first phase of evaluation are divided into three main scopes, specifically *student's learning environment; system, technology, and standards;* and *tutoring and didactics*.

- The first category, "student's learning environment," is composed of four basic attributes: ease of use, communication, functional environment, and help.
- The "system, technology and standards" category comprises the basic attributes of *technological independence, security and privacy, licensing and hosting,* and *standards support.* Technological independence relates to the evaluation of accessibility of an LMS. Security and privacy focuses on security and privacy of users and of an LMS.
- "Tutoring and didactics" relates to instructional issues such as course development, activity tracking, and assessment criteria.

The second phase of the evaluation according to Pipan et al. (2010) aims at usability evaluation, but the authors seem to take the traditional approach to usability, focusing mainly on the three traditional usability dimensions: effectiveness, efficiency, and satisfaction. Although this comprehensive framework emphasizes the user, at the same time it neglects other important aspects of interaction such as emotional, experiential, and other issues that define the so-called user experience (UX).

In the same vein, Orfanou et al. (2015) conducted a usability evaluation study of two well-known LMS platforms employing the System Usability Scale (SUS). These scholars try to further validate the use of SUS in the context of e-learning systems; however, while SUS is a very well established and validated instrument, it is quite generic and requires customization when applied to e-learning. In addition, as an instrument oriented toward usability measurement, it omits some other aspects that relate to the holistic view of UX.

Other scholars focus mainly on technical aspects of LMSs. For instance Kurilovas (2009) elaborated on a methodology that expands on a subset of the criteria, mainly focusing on the technical aspects of LMSs such as the following:

1. Overall architecture and implementation issues, such as scalability of the system, modularity and extensibility, and security
2. Interoperability
3. Cost of ownership
4. Issues that refer to the strength of the development community for open source products, such as the longevity of installed base and, documentation, the open development process, and the commercial support community
5. Licensing
6. Internationalization and localization issues
7. Accessibility
8. Document transformation

Kim and Lee (2007) developed their study around these instruction-related and e-learning-related criteria: instructional management, interaction, evaluation, information guidance, screen design, technology, and organizational demand.

The first four of these criteria directly relate to instructional issues, whereas screen design, technology, and organizational demand support instructional activities specific to e-learning. In Kim and Lee's framework, many elements relate to the interaction of users with an LMS; its primary focus, however, is on the functional requirements and usability issues. For instance, screen design evaluation centers on usability issues such as visual design, clarity of directions, consistency, readability, ease of navigation, learner control, appropriateness of multimedia, and so forth.

It is evident that all the above frameworks take a traditional managerial approach and investigate LMS through the lens of administrative activities. In addition, some of the more recent works acknowledge the importance of human factors and usability, but they do not take an open and holistic UX-oriented view. To this end, we argue that these frameworks require enhancements to address the ever-increasing demands of the users and the new trends in LMS design and implementation. It is of high importance that we underscore the emergence of UX and identify its critical elements so as to help e-learning designers and practitioners build effective and motivational learning experiences.

RECENT TRENDS AND THE EMERGENCE OF UX

Recent surveys (Spiro, 2014) on LMS satisfaction and spending trends found that almost 50% of the respondents are looking to change their existing learning management system (LMS) due to problems such as these:

1. Lack of mobile features
2. Dated appearance and user experience
3. Difficulty of use
4. Poor reporting features
5. Poor customer support
6. Inability to adapt to changing needs

Of the problems noted above, most relate to two kinds of issues: design issues that directly affect the user (aka customer) experience, such as poor usability, poor visual design, and lack of responsive design, and managerial issues, such as reporting capabilities and adjustments to organizational needs. In addition to focusing on administrative and managerial issues, it is imperative that vendors and developers incorporate human-centered design dimensions in their practices and apply a UX-driven philosophy and practices in the LMS development and implementation process.

UX focuses on the investigation of the feelings and thoughts of humans about an interactive product or system or application. UX, established and widely

acknowledged as one of the most important quality parameters, involves mainly two sub-qualities: traditional usability or pragmatic quality and hedonic, beauty, experiential, and affective factors (Hassenzahl & Tractinsky, 2006). It seems that the increasing importance of UX comes as the main answer to the shift in user expectations and growing demands. The pervasiveness of technological innovations has combined with the massive and heterogeneous user population to set new standards for humans' interaction with systems and interactive products. Multi-modal design, social networking, and gamification techniques are just a few of the major recent developments that can be aligned with the so-called UX process design. To this end, hundreds of companies have incorporated UX practices and methods in business strategy and development as a crucial parameter for delivering great customer experiences (Gribbons, 2013).

New trends in LMS platforms can help to overcome the aforementioned challenges. The following summarizes some of the most popular trends in designing the new generation of LMSs (Gautam, 2012):

1. Cloud-based LMS: Cloud-based LMSs have the capacity to bring down the cost of ownership, very important especially for small and medium enterprises.
2. Personal Learning Environment: The PLE involves the smooth integration of web 2.0 services. For instance, it is important for users to have several functionalities related to social networks in one place for viewing. In addition it is important to incorporate a semantic search function to enhance the user experience. Platforms with a semantic search function understand and track the user's search intention and context. In the same vein, a modern LMS must be able to assess learners' interests and gaps in knowledge and skills and proactively suggest new information, courses, social communities, and networks for consideration. In addition LMSs must provide a facility for user-based content generation.
3. A user experience that enhances learners' motivation and engagement: LMSs can employ new techniques such as gamification characteristics or APIs that support the incorporation of game mechanics.

In addition, when referring to UX issues in the context of e-learning technologies and platforms, it is important to emphasize learners' control and autonomy. An abundance of new technologies give learners the power to take control of their own learning: MOOCs, wikis, blogs, virtual worlds and games, social networks, and so on. On the other hand, learners are becoming more mature users of technology and they have greater expectations. It is evident that learning is becoming a more "pull" and less "push" process. To this end there is a greater need than ever for personalized learning experiences. LMSs need to offer

personalized learning paths based on the outcome of previous learners' activities. LMS developers must place greater emphasis on self-directed learning in response to changing learner expectations, including the increased need to feel autonomous and in control of one's own learning.

We should note a related phenomenon: The job of learning professionals (e.g., instructors/trainers, instructional designers and e-learning designers, HRD managers) is rapidly changing. It is no longer enough to create e-learning courses and schedule learning and training events. Learning professionals need to be supported in a new role involving the collection and combination of various information and learner-generated content. Learning professionals must be able to provide holistic learning experiences that target both learners' cognitive and emotional needs. To this end we assert that there is a need for a shift in the new evaluation frameworks for LMSs in the following dimensions:

- From evaluation of the administration and management experience to evaluation of the user experience.
- From evaluation based on an instructor-centered model to evaluation based on customer-centered development (with 'customer' comprising instructors, learners, and other stakeholders).
- From the LMS as the locus for a closed, formal learning experience to a platform supporting learners' need to interact through social networks and other collaborative informal learning spaces.
- In accordance with the above analysis, we attempt to formulate a new conceptual model and a related survey tool for the evaluation of LMSs guided by the UX perspective. Next sections present our method and the empirical work we have accomplished, along with data analysis, preliminary results, and discussion.

METHOD

DESIGN OF THE SURVEY

The underlying theoretical background for the design and setup of our survey tool for the evaluation of LMSs follows the tradition of UX research and Self-Determination Theory (SDT). One of the most influential models in UX literature is the one proposed by Hassenzahl (2003); according to this model each interactive product or system has both a pragmatic and hedonic quality, each of which contributes to the UX. SDT, which fosters relatedness, competence, and autonomy, is one of the most well researched psychological theories of intrinsic motivation (Deci and Ryan, 1985):

- Relatedness refers to the universal need to interact and be connected with others.
- Competence refers to the universal need to be effective and master a problem in a given environment.
- Autonomy refers to the universal need to control one's own life.

We combined Hassenzahl's model and SDT to provide an interpretation framework for our empirical work on the new LMS evaluation model we propose.

SURVEY INSTRUMENT AND DATA COLLECTION

A key aspect of our research involved developing a survey instrument to measure specific dimensions of UX in the context of LMS. In order to improve the process of the instrument development, we conducted a content validity check and a small pilot study. For content validity purposes we asked three experts in UX research and e-learning design to review the instrument we had developed. Experts gave feedback on the main measurement dimensions and the number of items. We conducted a parallel pilot study with 10 e-learning professionals (designers, educators, LMS administrators) and gathered feedback primarily on the wording of some items in the questionnaire. Based on the responses from experts and e-learning professionals, we developed a revised version of the questionnaire; some items were deleted, some others were merged and reworded. The final version contained the main part, with 48 items for gathering UX responses, and a second part, with questions designed to gather demographic information (see Appendix).

STUDY PARTICIPANTS

We sent out the survey instrument to more than 1,000 learning professionals through a well-known industrial e-learning portal, elearningindustry.com. The LMS roles of the participants broke down as follows: Almost 33% of the study participants were learners, 25% were LMS administrators, while 42% were professors and trainers (though most in this last group have LMS administrator rights as well).

The online survey lasted one and a half months. We received responses from 808 participants overall[1]; however, 362 responses showed incomplete data and missing values and were thus deleted from the dataset. The majority of the respondents self-identified as male (64%) and 36% as female. All respondents reported high proficiency in computer and Internet usage.

[1] The authors would like to thank all the participants who answered the online survey providing data for this study.

DATA ANALYSIS AND RESULTS

We used several statistical methods to examine the data. Descriptive statistics were run to analyze the collected data; we also performed an exploratory factor analysis to condense a large set of variables down to a smaller number of dimensions or factors. As a main tool for performing the statistical analyses we used the Statistical Package for the Social Sciences (SPSS) 17.0. In order to validate the identified factor structure, we performed reliability tests by assessing the internal consistency of the items using Cronbach's alpha coefficient.

FACTOR ANALYSIS

Through explanatory factor analysis, we identified the underlying dimensions of LMS user experience as perceived by the respondents. The Kaiser-Mayer-Olkin (KMO) Measure of Sampling Adequacy (which indicates whether the sample size is adequate for performing factor analysis and varies from 0 to 1.0) was 0.969, comfortably higher than the recommended level of 0.6 (Hair et al., 1998). We applied the following rules to this factor analysis:

1. Used a principal components extraction (a method to extract factors generally used for data reduction) with Varimax rotation, the most common rotation method. (Rotation serves to make the output more understandable and is usually necessary to facilitate the interpretation of factors.)
2. Used a minimum eigenvalue (which represents the amount of variance accounted for by a factor) of one as a cutoff value for extraction.
3. Deleted items with factor loadings less than 0.32 on all factors or greater than 0.32 on two or more factors.

According to the above criteria, a solution with four factors was extracted explaining 62.648% of the variance (Table 1). This percentage is quite high, leading us to consider the survey instrument in this study to operate successfully. The whole process of interpretation of the factor analysis led to the refinement of the questionnaire and a more parsimonious solution, with four factors representing user experience parameters of LMS platforms as follows: Pragmatic Quality, Motivation and Engagement, Authentic Learning, Autonomy and Relatedness.

Items	Factor loadings	Factors	Total variance explained (%)
q13	.857	Pragmatic Quality	46.68
q17	.704		
q27	.699		
q12	.698		
q10	.690		
q14	.682		
q28	.673		
q16	.668		
q9	.645		
q8	.645		
q25	.643		
q15	.627		
q26	.601		
q11	.522		
q18	.425		
q19	.369		
q23	.356		
q7	.342		
q29	.321		
q53	.751	Motivation and Engagement	7.18
q52	.740		
q54	.715		
q43	.458		
q50	.420		
q49	.334		
q47	-.830	Authentic Learning	5.35
q46	-.743		
q44	-.580		
q48	-.525		
q45	-.436		
q41	-.307		
q35	-.715	Autonomy and Relatedness	3.43
q32	-.645		
q36	-.640		
q33	-.620		
q39	-.567		
q34	-.563		
q37	-.545		
q38	-.435		
q40	-.382		

Table 1: Factor solution

In addition, factor analyses led to a reduced set of variables (i.e., items in the questionnaire). The first version of the questionnaire contained 51 items (48 regarding the UX dimensions, and three questions about demographics). The second version of the questionnaire (after the factor analysis and the respective interpretation) contained 40 items representing four user experience constructs (the four factors extracted as already presented). Table 2 presents the main descriptive statistics of the four factors.

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
PQ	421	1.00	5.00	3.7440	1.05683
Meng	454	1.00	5.00	3.3546	1.49151
AuL	460	1.00	5.00	3.8656	1.29576
AuTCom	450	1.00	5.00	3.188	1.15925
Valid N (listwise)	372				

Table 2: Descriptive statistics of the four factors

RELIABILITY AND VALIDITY

In order to determine the reliabilities of the factors and to assess the internal consistency of the factors, we used Cronbach's alpha. All the factors have high values of Cronbach's alpha, with each factor measuring above 0.8, thus close to one. The specific Cronbach alphas are presented in Table 3, below.

Factors	**Cronbach alpha**
Pragmatic Quality	α= .958
Motivation & Engagement	α= .891
Authentic Learning	α= .878
Autonomy & Relatedness	α= .903

Table 3: Internal consistency of the factors

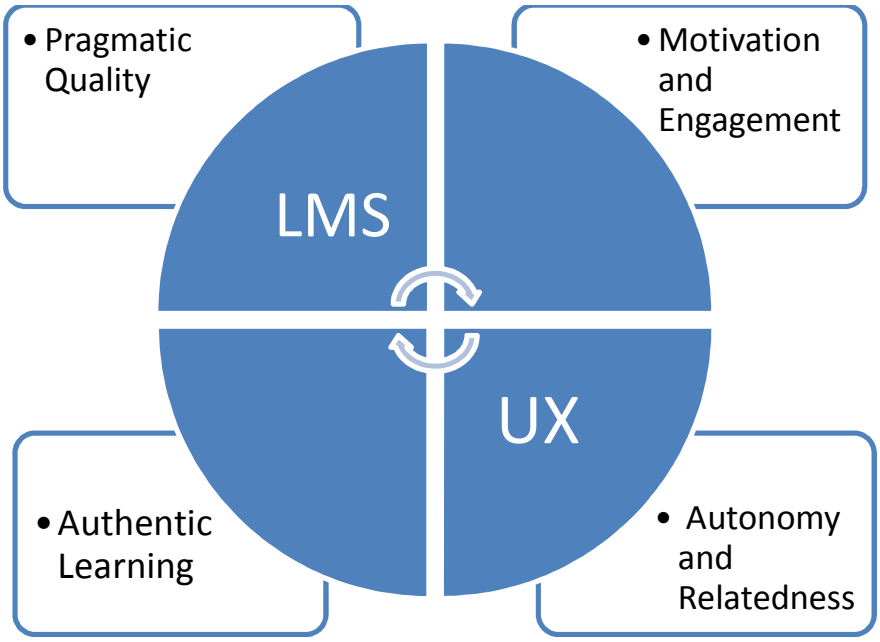


Figure 1: UX evaluation dimensions for LMS

INTERPRETATION OF FINDINGS AND FUTURE RESEARCH

The findings of the statistical analyses revealed four factors. We arrived at an interpretation based on Hassenzahl's model of UX and SDT, through which process we propose a new UX-driven evaluation model for contemporary LMS platforms. The figure above depicts the main evaluation dimensions.

PRAGMATIC QUALITY

All the interactive systems or applications have a pragmatic and hedonic quality that make up the user experience (Hassenzahl, 2003). The pragmatic quality is related to the users' need to achieve behavioral goals, the "do" goals. This in turn is related to the main aspects of usability of a system. Effectiveness, efficiency, and perceived satisfaction are the main archetypical usability dimensions for every interactive system. The e-learning context, however, requires additional dimensions for pragmatic quality. Several researchers (Lanzilotti et al., 2006; Zaharias, 2006, Nokelainen, 2006) have proposed that traditional usability parameters need to be augmented with design parameters from other fields such as learning design and instructional design. It seems that effectiveness and efficiency have a different meaning in the context of e-learning courses and platforms (Zaharias, 2009).

AUTHENTIC LEARNING

When dealing with the design of learning experiences, one of the most important elements is to create meaningful learning interactions that relate to real world situations. Authentic learning experiences typically relate to the real world and complex problems. Learning environments must provide affordances for effective integration of learning methods that go beyond the passive absorption of learning content. These can include role-playing exercises, problem-based activities, case studies, and participation in virtual communities of practice (Chang et al., 2010).

Design of these environments has to support a whole range of learners' needs. Learners seek opportunities to apply their knowledge to solve real problems; they want to be able to explore new contexts; they need to find connections and build communities of practice (Lombardi, 2007). Especially for building communities of practice, we see that key tenets of connectivism (Siemens, 2004) suggest meaning-making and forming connections between specialized communities are important activities. Emerging learning technologies such as MOOCs try to incorporate these kinds of opportunities in order to provide rich and meaningful learning experiences. We assert that modern LMS platforms also need to evolve towards these directions.

AUTONOMY AND RELATEDNESS

Autonomy can be defined as "the ability to take charge of one's own learning" (Holec, 1981). In the extant literature, autonomy has been approached as a psychological state (Little, 1991), as a situation (Dickinson, 1992) and as the right of learners (Benson, 2001).

Learner autonomy is considered a very important type of self-directed learning in authentic learning environments **(**Ribbe and Bezanilla, 2013) where the learners take over the functions of the instructors in selecting content and methods and in guiding the whole learning process (Little, 2004 and 2012). In e-learning and blended learning environments, autonomy also reflects the challenges that learners face regarding the efficient use of the learning management system and the related learning activities. Some researchers assert that efficient use of the LMS is an individual skill of the learner that should be seen as separate from the actual learning goal (Little, 2004 and 2012), which makes the whole task of designing the e-learning experience even more challenging.

As already mentioned, this study has been influenced by the approach suggested by Deci and Ryan (1985) who define autonomy as a process of "self-determination" or "self-regulation." According to this perspective, learners feel that they are involved in authentic learning activities to the degree that they identify those activities as their own. In addition, autonomy is strongly associated with "relatedness," a term that refers to the learners' needs for contact, support, communication, and community-building with others. In keeping with the above premises, a modern LMS must provide affordances for "autonomous interdependence."

MOTIVATION AND ENGAGEMENT

Motivation and engagement are perhaps the most important elements of every form of learning experience. Motivation refers to the internal processes that give behavior its energy and direction (Reeve, 1996). Energy relates to the strength, intensity, and persistence of the behavior concerned. Direction gives the behavior a specific purpose. Behavior can be intrinsically and extrinsically motivated. Extrinsic motivation is grounded in external factors such as social approval/disapproval, rewards, or avoiding negative consequences. Intrinsic motivation can be characterized as the drive arising within the self to carry out an activity whose reward is derived from the enjoyment of the activity itself (Csikszentmihalyi, 1975).

Some sources associate motivation with learning effectiveness in several contexts and with media such as LMS, games, virtual worlds, and MOOCs (Papastergiou, 2009; Lopez-Morteo and Lopez, 2007; Kebritchi et al., 2010). Other scholars have investigated the relationship between usability design and

motivation to learn in e-learning contexts (Zaharias, 2006, 2009). One might argue that motivation is an absolutely essential requirement for every learning process and for every learning environment. It relates so closely to engagement that many prior empirical works use these terms interchangeably. The issue of learners' engagement has gained a lot of attention lately, especially in the context of new educational technologies such as MOOCs. Several scholars have asserted that there is a serious problem in learners' engagement and motivation, due in part to poor technology design and usability. New methodological and technological trends such as gamification practices and platforms aim to bring solutions to this complex problem. Modern LMS platforms follow these trends in order to provide motivating and engaging learning experiences.

FUTURE RESEARCH

In the near future, the main research efforts will aim to provide additional evidence for reliability and validity of the model. For instance, we may modify the second version of the questionnaire developed in this study and develop a new, more compact questionnaire by replacing and re-wording some of the few items that did not discriminate well. We may also use confirmatory factor analysis to determine convergent and discriminant (or divergent) validity (Wang, 2003). After further validating the instrument, we will design a protocol that includes a severity scale for prioritization of both usability and UX issues, and a scoring scheme for the evaluation dimensions. Toward this end, the proposed model and the related evaluation protocol can also provide benchmark information. The evaluation model will be used to assess numerous LMSs, which may lead to the development of a standardized benchmarking database that contains the UX quality profiles of commercial and open-source LMS platforms.

REFERENCES

Al-Busaidi, K.A. & Al-Shihi, H. (2010). Instructors' Acceptance of Learning Management Systems: A Theoretical Framework. *Communications of the IBIMA*, Vol. 2010 (2010).

Alias, N. A., & Zainuddin, A. M. (2005). Innovation for better teaching and learning: Adopting the learning management system. *Malaysian Online Journal of Instructional Technology*, *2*(2), 27-40.

Almarashdeh, I., Sahari, N., Zin, N., & Alsmadi, M. (2011). Acceptance of learning management system: A comparison between distance learners and instructors. *Advances in Information Sciences and Service Sciences, 3*(5), 1-9.

Benson, P. (2007). Autonomy in language teaching and learning. *Language Teaching*, *40*, 21-40.
Carlson, A (2002). Authentic Learning: What Does It Really Mean? *Western Washington University: Innovative Teaching Showcase.* (2002) Retrieved from: http://pandora.cii.wwu.edu/showcase2001/authentic_learning.htm
Chang, W.C., Lee, H.J., Wang, C.Y., & Chen, G.D. (2010). Improving the authentic learning experience by integrating robots into the mixed-reality environment. *Computers & Education 55* (2010) 1572–1578
Csikszentmihalyi, M. (1975). *Beyond boredom and anxiety: The experience of play in work and games*. San Francisco: Jossey-Bass.
Deci, E. & Ryan, R. (1985). *Intrinsic motivation and self-determination in human behavior (perspectives in social psychology)*. New York: Plenum Press.
Dickinson, L. (1992). *Learner autonomy 2: Learner training for language learning.* Dublin: Authentik.
Emelyanova, N. & Voronina, E. (2014). Introducing a learning management system at a Russian university: Students' and teachers' perceptions. *International Review of Research in Open and Distance Learning, 15*(1). Athabasca University Press.
Gautam, A. (2012). 4 key emerging trends in LMS. Retrieved from: http://www.upsidelearning.com/blog/index.php/2012/09/18/4-key-emerging-trends-in-lms/
Gribbons, W. (2013). The Four Waves of User-Centered Design. 947, *UX Magazine,* January 2013.
Hair, J.F, Tatham, R.L., Anderson R.E., & Black, W. (1998). *Multivariate data analysis* (5th ed.). London: Prentice-Hall.
Hassenzahl, M., (2003). The thing and I: understanding the relationship between user and product. In M. Blythe, C. Overbeeke, A.F. Monk and P.C. Wright (Eds.), *Funology: From Usability to Enjoyment* (pp. 31-42). Dordrecht, Netherlands: Kluwer.
Hassenzahl, M., & Tractinsky, N. (2006). User Experience – a Research Agenda. *Behaviour and Information Technology , 25*(2), 91-97.
Holec, H. (1981). *Autonomy and foreign language learning: Prepared for the Council of Europe*. Oxford: Pergamon.
Kim, S.W. & Lee, M.G. (2007). Validation of an evaluation model for LMS. *Journal of Computer Assisted Learning* (2008), *24*, 284-294.
Kebritchi, M., Atsusi, H, & Haiyan, B. (2010).The effects of modern mathematics computer games on mathematics achievement and class motivation. *Computers & Education, 55*(2), 427-443.

Kurilovas, E (2009, September). *Methods of Multiple Criteria Evaluation of the Quality of Learning Management Systems for Personalised Learners Needs.* Presented in *Learning Management Systems meet Adaptive Learning Environments,* EC-TEL 2009, Nice, France.

Lanzilotti, R., Ardito, C., Costabile, M.F., & De Angeli, A. **(**2006). eLSE Methodology: a Systematic Approach to e-Learning Systems Evaluation**.** *Journal of Educational Technology & Society, 9*(4), 42-53.

Little, D. (1995). Learning as dialogue: The dependence of learner autonomy on teacher autonomy. *System*, *23*(2), 175-181.

Little, D. (2004). Constructing a theory of learner autonomy: some steps along the way. In K. Mäkinen, P. Kaikkonen, & V. Kohonen (Eds.), *Future Perspectives in Foreign Language Education* (pp. 15-25). Oulu, Finland: Oulu University Press.

Little, D. (2012, September). *Two views of learner autonomy and their implications for applied linguistics research.* Presented at the 37th Annual FAAPI Conference, San Martin de los Andes, Argentina.

Lopez-Morteo, G., & Lopez, G. (2007). Computer support for learning mathematics: a learning environment based on recreational learning objects. *Computers & Education*, *48*(4), 618-641.

Lombardi, M. M. (2007). Authentic learning for the 21st century: An overview. In D. G. Oblinger (Ed.), *EDUCAUSE Learning Initiative.*

Mohawk College (2009). *Final Report of the Learning Management System Project.* Retrieved from http://lmsreview.mohawkcollege.ca/docs/LMSreviewFinalReport_ModifiedBrief.pdf

Naveh, G., Tubin, D., & Pliskin, N. (2010, June). Student LMS use and satisfaction in academic institutions: The organizational perspective. *The Internet and Higher Education 13*(3), 127-133. doi:10.1016/j.iheduc.2010.02.004

Naveh, G., Tubin, D., & Pliskin, N. (2012). Student satisfaction with learning management systems: A lens of critical success factors. *Technology, Pedagogy and Education, 21*(3), 337-350.

Nokelainen, P. (2006). An empirical assessment of pedagogical usability criteria for digital learning material with elementary school students. *Educational Technology & Society, 9*(2), 178-197.

Orfanou, K., Tselios, N. & Katsanos, C. (2015). Perceived Usability Evaluation of Learning Management Systems: Empirical Evaluation of the System Usability Scale. *International Review of Research in Open and Distributed Learning*, *16*(2).

Papastergiou, M. (2009). Exploring the potential of computer and video games for health and physical education: A literature review. *Computers & Education, 53*(3), 603-622.

Pipan, M., Arh, T., Jerman Blažič, B. (2010). The Evaluation Cycle Management - Method Applied to the Evaluation of Learning Management Systems. In Tasos Spiliotopoulos, Panagiota Papadopoulou, Drakoulis Martakos, Georgios Kouroupetroglou (Eds.), *Integrating Usability Engineering for Designing the Web Experience: Methodologies and Principles*. Hershey, PA: IGI Global

Reeve, J. (1996). *Motivating Others: Nurturing Inner Motivational Resources*. Boston: Allyn and Bacon

Ribbe, E. & Bezanilla, M.J. (2013, December). Scaffolding learner autonomy in online university courses. *Digital Education Review*, 24.

Ryann K. (2009). Field Guide to Learning Management Systems. *ASTD Learning Circuits.*

Siemens, G. (2004). Connectivism: A Learning Theory for the Digital Age. *elearnspace.* (2004). Retrieved from: http://www.elearnspace.org/Articles/connectivism.htm

Spiro, K. (2014). 5 eLearning Trends Leading to the End of the Learning Management System. Retrieved fromhttp:/elearningindustry.com/5-elearning-trends-leading-to-the-end-of-the-learning-management-system

Wang, Y.S. (2003). Assessment of learner satisfaction with asynchronous electronic learning systems. *Information & Management, 41,* 75-86.

Zaharias, P. (2006). A usability evaluation method for e-learning: Focus on motivation to learn. In *Extended Abstracts of Conference on Human Factors in Computing Systems,* CHI 2006, Montréal, Canada.

Zaharias, P. (2009). Usability in the Context of e-Learning: A Framework Augmenting "Traditional" Usability Constructs with Instructional Design and Motivation to Learn. *International Journal of Technology and Human Interaction (IJTHI), 5*(4), 37-59

APPENDIX

A. User experience of LMS

Please rate your experience with the LMS in your organization. IF an item does not apply, please choose the *Not Applicable* option (NA). Note that this evaluation is subjective in nature and there is no "right" or "wrong" answer.

Scale: *1=Strongly Disagree, 2=Disagree, 3= Neither agree or disagree (Neutral), 4=Agree, 5=Strongly Agree, NA= Not Applicable*

Criteria	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	NA
The LMS keeps the learner informed through constructive, appropriate and timely feedback.						
The LMS responds well to user-initiated actions. There are no surprise actions by the LMS or tedious data entry sequences.						
Language usage in terms of phrases, symbols, and concepts is similar to that of learners in their day-to-day environment.						
The same concepts, words, symbols, situations, or actions refer to the same thing.						
The LMS is compatible with common browsers on common hardware (pcs, mobile devices, tablets etc.)						

LMS dialogues do not contain irrelevant or rarely needed information, which could distract users.						
The LMS is designed in such a way that the users cannot easily make serious errors.						
When a user makes an error, the LMS responds with an appropriate error message.						
LMS messages define problems precisely and give quick, simple, constructive, specific instructions for recovery.						
Objects to be manipulated, options for selection, and actions to be taken are visible.						
The user does not need to recall information from one part of the LMS to another.						
Instructions on how to use the LMS are visible or easily retrievable whenever appropriate.						
The LMS caters for different levels of users, from novice to expert.						
Shortcuts or accelerators, unseen by novice users, are provided to speed up interaction and task completion by frequent users.						
The LMS is flexible to enable users to adjust settings to suit themselves, i.e. to customize the interface.						

The LMS has a help facility and other documentation to support users' needs.						
Information in help facilities is easy to search, task-focused, and lists concrete steps to accomplish a task.						
The LMS provides a semantic search function that understands and tracks user's search intention and context.						
The LMS has a simple navigational structure.						
Users know where they are and have the option to select where to go next.						
The navigational options are limited, so as not to overwhelm the user.						
Related information is placed together.						
The LMS generates useful reports regarding the activities of learners and instructors in the courses, discussion forum, quizzes etc.						

Course analysis includes progress reports and consists of both the activities and timestamps of when the activity occurred.						
Learners' behavior tracking is integrated with gamification APIs and platforms.						
Facilities and activities are available that encourage learner-learner and learner-instructor interactions.						
Facilities are provided for both asynchronous and synchronous communication (such as e-mail, discussion forums etc.).						
Learners have some freedom to direct their learning.						
Instructors can customize learning artifacts to the individual learner (e.g. tests and performance evaluations can be customized to the learner's ability).						
LMS provides the possibility to import tests and quizzes from other sources.						

Where appropriate, learners can take the initiative regarding the content and sequence of learning.						
There are multiple representations and varying views of learning artifacts and tasks.						
The LMS supports different strategies for learning.						
The LMS can be easily integrated with other media (blogs, YouTube, Twitter feeds, LinkedIn forms) to support learning.						
Metacognition (the ability of a learner to plan, monitor and evaluate his/her own cognitive skills) is encouraged.						
Learners are able to tag learning components.						
Learners give and receive prompt and frequent feedback about their activities and the knowledge being constructed.						
Learners are guided as they perform tasks.						
Quantitative feedback, e.g. grading of learners' activities, is given, so that learners are aware of their level of performance.						

Authentic, contextualized tasks are undertaken rather than abstract instruction.						
Learning occurs in a context of use so that knowledge and skills are transferable to similar contexts.						
The representations are understandable and meaningful, ensuring that symbols, icons and names used are intuitive within the context of the learning task.						
The LMS incorporates interactive features that attract and motivate learners.						
The LMS incorporates game mechanics (e.g. points, badges, leaderboards, levels etc.) to further engage the learners.						
Gamification elements (when available) are easy to use by the instructors to further develop their learning environment.						
The LMS provides features to assess learners' interests.						
The LMS provides features to assess learners' gaps in knowledge and skills.						
The LMS proactively suggests new sources (e.g. information, courses, social communities and networks) to learners for consideration.						

B. Demographics

1. What is your age?

- ☐ 18-24
- ☐ 25-34
- ☐ 35-44
- ☐ 45 -54
- ☐ 55 – 64
- ☐ 65 +

2. What is your LMS role?

- ☐ Learner / Student
- ☐ Facilitator / Instructor / Professor
- ☐ Administrator

3. What is your role in the organization?

- ☐ Senior management (C-level, president, principal, or director)
- ☐ Manager or supervisor
- ☐ Faculty, professor, or instructor
- ☐ Instructional designer or developer
- ☐ Graphics, video, multimedia, or web developer
- ☐ Training or L&D practitioner
- ☐ HR practitioner
- ☐ Intern, Student
- ☐ Consultant
- ☐ Other

FROM INSTRUCTIVISM TO CONNECTIVISM: THEORETICAL UNDERPINNINGS OF MOOCS

Matt Crosslin
University of Texas at Arlington

ABSTRACT

While the first MOOCs were connectivist in their approach to learning, later versions have expanded to include instructivist structures and structures that blend both theories. From an instructional design standpoint the differences are important. This paper will examine how to analyze the goals of any proposed MOOC to determine what the epistemological focus should be. This will lead to a discussion of types of communication needed—based on analysis of power dynamics—to design accurately within the determined epistemology. The paper also explores later stages of design related to proper communication of the intended power structure or theoretical design as these relate to various activities and expectations in the MOOC.

Keywords: MOOC, instructivism, connectivism, constructivism, power dynamics, zone of proximal development, pedagogy, andragogy, heutagogy, learning and teaching as communication actions (LTCA), normative communication actions, strategic communication actions, constative communication actions, dramaturgical communication actions

FROM INSTRUCTIVISM TO CONNECTIVISM: THEORETICAL UNDERPINNINGS OF MOOCS

Matt Crosslin[xiv]
University of Texas at Arlington

INTRODUCTION

When determining the need for a new course, many educational institutions think about factors such as demand, necessity, costs involved, and other standard concerns. This analysis phase generally will include analyses such as a needs assessment or a skills test to determine what content the course should cover. MOOCs offer a unique challenge in this area in that a larger number of learners can enroll, often coming from outside the typical population an institution is accustomed to serve. How does one perform a needs assessment or test skills of a sample learner population for the first offering of the course when the whole world constitutes the pool of potential learners?

The analysis phase of designing a MOOC is often left up to the professional opinion of those who want to offer a MOOC covering a particular topic. Professionals in a given field begin to notice certain patterns and eventually conclude that a MOOC would be an interesting avenue to explore. Should this be the end of the analysis? Does such a limited analysis provide course designers with information about all the factors that careful MOOC design must take into account? One can argue that, as the various formats of MOOCs diversify, MOOC designers need to consider several largely ignored factors before they begin designing a course.

To this end, this article will examine some important theoretical underpinnings of course design that affect MOOCs. Areas to be covered include epistemologies, methodologies, communication goals, and power relations inherent in each. These theoretical areas of concern often involve people who take sides, advocating for competing perspectives and approaches to MOOC design. The popularized cMOOC versus xMOOC debate exemplifies such a case of polarized advocacy. Without assuming one side is better than the other, this article will examine the various aspects of theoretical perspectives and the power of those perspectives to help designers analyze design attributes that are appropriate for various educational goals.

THE BASICS OF ANALYSIS

Although this article will cover a lot of theoretical ground, a theory-based analysis of MOOC design does not have to be time-consuming. Before jumping into

specific theories and ideas, an examination of the overall process is in order. Keep in mind that an initial MOOC design analysis can start off as a "rough draft" that is updated and revised as the course is developed. The analysis process would look like this (see Appendix A for a sample worksheet that might be helpful):

1. *Determine the main epistemological focus of the MOOC.* There can (and probably will) be elements of all epistemologies in the course. Conversely, most courses tend to operate with one underlying power structure to guide design and development. Power structures can be seen as a guide for epistemology, but they should not be confused as being the same the thing.
2. *Decide the main methodology that will be utilized in the design.* Again, there will be elements of all, at times, but knowing the main underlying methodology will help guide the course design analysis.
3. *Look at what types of interaction are desired for the course.* For this stage of analysis, there might be one main type of interaction, or several.
4. *Begin matching the types of interaction with the epistemological and methodological design of the course.* Some types of interaction may fall outside of the main epistemology and methodology of the course and that is fine, as long as the designer makes sure to take note. Designers who lean towards a power structure or design method that is different from those initially chosen might consider going back and revising those choices.
5. *Map out what kind of communicative actions will be needed for each activity based on course epistemology and methodology* (or outlying epistemology and methodology, as needed).

Consider a course on changing trends in the healthcare industry as an example to take through this analysis. (Note that the technical terms in italics, below, will be explored later in the article.) For this healthcare course, the course designer has decided that a connected learning approach (*connectivism*) is the best overall epistemology because the course topic covers "changing trends." Learners would be well served to form a network of resources that will keep them up to date on an ever-changing topic. For the purpose of this course, spending large amounts of time learning current information would not be helpful when that knowledge itself will be obsolete in a year. The course topic involves a mix of expert knowledge and life experience; therefore the designer chooses a methodological focus (*heutagogy*) that encourages participants to learn how to be learners. Bringing these two analyses together, the designer determines that the course needs to be designed in a *connectivist heutagogical* manner. This determination impacts all subsequent design decisions, including course communications patterns. Instead

of forming students into course-specific groups that might not exist after the course, the designer focuses on leveraging network interactions for course activities. Some of these interactions are *student-student* interactions; others are *student-interface* interactions. Therefore, the course designer decides that *normative communicative actions* must occur in order to explain what is happening in the course. Moreover, some *strategic communicative actions* will help learners who might need guidance on how to network. The goal of these normative and strategic communicative actions will not be to look at facts, but rather to encourage students to network with others for the purpose of learning how to be well-connected to other learners and learning objects related to ever-changing health trends. However, the course designer also realizes that the MOOC confers a certificate of completion and therefore determines the need for some kind of final assessment that authorizes granting the credential. The designer decides to add an assignment at the end that utilizes the construction of learned experiences in the form of a blog reflection (a *constructivist andragogic* approach). This would require some *normative communicative actions* to explain the assignment followed by the learner producing *dramaturgical communicative actions* that express how they have integrated what they learned in the course with their existing knowledge.

This example highlights one possible combination of the various theories and ideas that affect course design. The goal of this article is to examine many of these theories, as well as lay out a simple plan for determining the factors that should guide MOOC design. The first area of MOOC analysis to be examined will be the overall power dynamics that determine who controls the content and activities and what that means for the design phase of MOOC creation.

EPISTEMOLOGY: POWER DYNAMICS IN LEARNING

One of the more basic concepts to affect society and by extension the institution of formal education is who controls power in educational settings. For the purpose of this article, power is defined as "the capacity of one party (the agent) to influence another party (the target)" (Yukl, 2006, p. 146). Jurgen Habermas (1971) connects power with education and knowledge when he writes about the various types of knowledge that exist in society. As will be examined, the types of knowledge Habermas identifies match up with what Anderson and Dron (2011) call the three generations of distance education pedagogy: cognitive-behaviorist, social constructivist, and connectivist pedagogy.

One type of knowledge that Habermas (1971) focused on was instrumental knowledge, basic knowledge that humans need in order to survive and attempt to control their own environment. In education, the transmission of instrumental knowledge is often referred to as instructivism. Instructivism is a general idea that "assumes the effectiveness of passive reception of sanctioned information through

memorization and recall" (Porcaro, 2011, p. 40). Some of the bigger ideas associated with instructivism are behaviorism (as explained in the work of Skinner and Thorndike) as well as cognitivism (as defined in the work of Gagne and Bruner). While these may seem to be very diverse positions, "instructivists, whether behaviorist or cognitivist, are ontologically objectivist and realist, and epistemologically empiricist…. they see learning as simply mapping the real, external world on to the minds or behaviors of the student" (Porcaro, 2011, p. 41). The main idea to focus on in all of this is that power in instructivism is external to the learner—usually residing with an expert instructor. This means that the instructor has established power that must be transferred to a learner.

Another type of knowledge that Habermas (1971) focused on was communicative knowledge, which is a type of knowledge that concerns our ability to interpret and negotiate understandings of the world with those around us. In education, this process of interpretation and negotiation is often referred to as constructivism. Constructivism is also a diverse idea that is "well-suited for teaching the epistemic practices and collaborative problem-solving skills necessary in a knowledge society while empowering learners through democratic participation in learning and dialogue" (Porcaro, 2011, p. 43). Among many strains of constructivist theory, two of the most important are cognitive constructivism (found in the work of Piaget) and sociocultural constructivism (found in the work of Vygotsky). One of the more well-known ideas to arise from constructivism is Vygotsky's Zone of Proximal Development (ZPD). The ZPD constitutes the distance between what a learner knows and what that learner can come to know when guided by a more knowledgeable other (Vygotsky, 1978). While this understanding of learning shifts some power to the learner, the ZPD still resembles a typical formal learning situation wherein learners are dependent on experts who hold the power.

One can argue that none of the learning theories discussed above describe learning that occurs when multiple experts connect to learn together. Many modern learning situations are brought about when a collection of knowledgeable individuals gather to dig deeper into a topic with which many of them are already familiar. To this end, Andersen and Ponti (2014) believe that the ZPD can be seen as existing on two levels: individual and collective. Therefore, another idea is needed to describe learning in environments that involve learners operating with distributed expertise, a dispersion of the power inherent in knowledge. Connectivism encapsulates ideas that underlie learning situations that feature dispersion of knowledge and therefore of power.

When examining behaviorism, cognitivism, and constructivism, George Siemens and Stephen Downes (2005) came to the conclusion that these theories did not address learning that occurs socially as a group (though it might describe learning the individual achieves through interaction with others, as described by

social constructivism). To address this issue Siemens and Downes developed a new theory they referred to as connectivism. According to Siemens (2005)

> Connectivism is the integration of principles explored by chaos, network, and complexity and self-organization theories. Learning is a process that occurs within nebulous environments of shifting core elements—not entirely under the control of the individual. Learning (defined as actionable knowledge) can reside outside of ourselves (within an organization or a database), is focused on connecting specialized information sets, and the connections that enable us to learn more are more important than our current state of knowing (p. 6).

Connectivism as a learning theory shifts the power in education away from individuals such as learners and instructors and onto a collective group. Individual work from instructors and learners still exists within connectivism; however, connectivism focuses the network and connections rather than individuals.

Connectivists assume power in learning can be distributed between three different locations: the instructors, the learners, or the network that forms among all participants. Since power is a dynamic aspect of society that shifts and changes, courses should not be seen as instantiating only one power dynamic that is set from the beginning. Courses may have one dominant power structure upon which most of the course is based (for example, "student-centered learning"), but other power structures may also exist at the same time for different aspects of learning or at different times in the learning sequence. Nevertheless, designers must understand what main power structure they desire for a course as an important first step in the analysis of a new course design, a topic that will be examined closely in the next section.

ANALYZING MOOC GOALS FOR POWER DYNAMICS

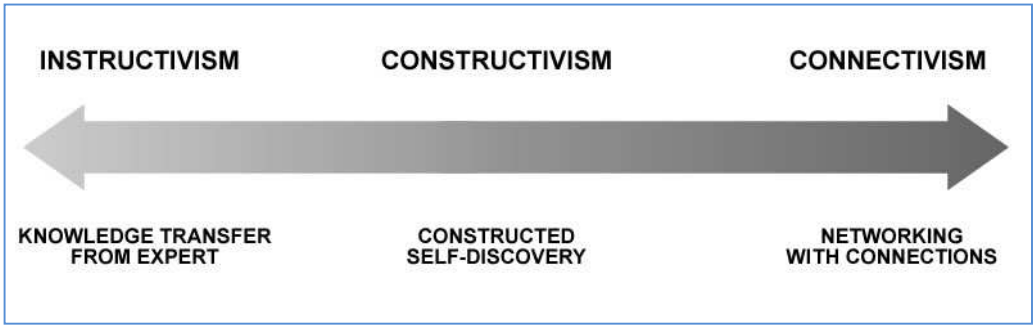
While all design decisions with any course are important, the decision about epistemological power structures can be one of the foundational decisions that guides everything from activity and content design to tool choice. However, an important distinction to keep in mind is that there are no hard, fast lines between instructivism, constructivism, and connectivism. Courses that focus on the instructor as content source can also have elements of interaction and connectivism. In like fashion, connectivist courses can also contain content that positions the instructor as knowledge expert. The important factor to determine in this area is where the main power of the course resides: with the instructor, the learners, or the network.

To this end, the course designer needs to take a preliminary look at the goals and objectives of the MOOC under design, and look at the competencies learners are to master. In some instances, the course may lend itself well to more

than one epistemology. In these cases, the course designer may want to choose a power structure that the instructors are most comfortable with (or even collaborate to stretch instructors' teaching abilities in unfamiliar power relationships with learners). However, there are several clues that may indicate which power dynamic is most appropriate. Some questions to consider are:

- Do learners need to gain knowledge (facts) and/or skills (abilities) by the end of the course?
- How would learners best gain these skills or facts? Through self-discovery, connecting with others, or through transfer from an expert?
- Would learners benefit from interacting with other learners to construct knowledge together (or even by debating various sides of issues)?

In general, the more that learners need to gain knowledge from the instructor, the more a course needs to lean towards instructivism. However, the more those learners can gain from self-discovery and reflection, the more a course needs to lean towards constructivism. Or in other scenarios, the more benefit learners could gain from connections with other learners or networks, the more the course needs to lean towards connectivism. Again, these three paradigms should not be considered mutually exclusive. Rather, in the real world, these paradigms can and do co-exist profitably. They can be thought of as points along a continuum:



In other words, design analysis at this stage should not involve determinations of the "rightness" of competing theories, but should be guided by where course goals fall along the continuum. This unbiased alignment of course goals to epistemology sets the foundation for the design stage. For instance, if analysis suggests the power structure inherent in the learning goals leans toward connectivism, course design would need to include relatively little direct instruction, and would involve more ill-structured problems, interactive exercises, learner-determined activities, and even artifacts based on learner preferences rather than pre-determined structures (such as papers, tests, etc). A course that relies on a power structure that leans toward constructivism would need to include

self-discovery activities, more student-centered learning, problem-based learning, and reflective artifacts such as blog posts. A course using a power structure that leans toward instructivism would need to involve more direct instruction, well-defined problems, guided exercises, instructor-led activities, and artifacts (such as standardized tests and research papers) that follow guidelines determined by the instructors. Of course, many of these activities and designs can be used in power structures other than the power structure that the above writing might suggest is "native" or "natural" to that activity/design.

Typically, many educational commentators and experts refer to MOOCs that lean toward instructivism as xMOOCs (for "MOOC as an eXtension of college") and MOOCs that lean toward connectivism as cMOOCs (for "connectivist MOOC"). These distinctions are not always absolute, as xMOOCs often have some connectivist characteristics and cMOOCs often have some instructivist traits (although there are also MOOCs that tilt completely toward one or the other extreme). Internet searches for either term could be very helpful in determining which direction a MOOC being designed could lean.

Once the epistemological power dynamic of a course has been determined, other areas of course design fall into place more easily. However, all course designers know that design is rarely a linear process. Further analysis may cause course designers to come back and re-examine the basic power structure of a course. Therefore, the initial decision regarding the predominant power structure appropriate to course goals is to be seen as a preliminary direction open to later modification. The next phase of MOOC design analysis builds on the foundational epistemology/power structure analysis by determining which theoretical design paradigm(s) to utilize.

METHODOLOGY: PEDAGOGY, ANDRAGOGY, AND HEUTAGOGY

In many circles, pedagogy is seen as a blanket statement to describe all teaching methodologies. However, as the contexts for teaching and learning continue to diversify, many are seeing limitations to the term "pedagogy" and have begun to look at other methodologies alongside—or sometimes in place of—pedagogy. In this context,

> The pedagogical model is a content model concerned with the transmission of information and skills, where the teacher decides in advance what knowledge or skill needs to be transmitted and arranges a body of content into logical units, selects the most efficient means for transmitting this content (lectures, readings, laboratory exercises, films, tapes, for example), then develops a plan for the presentation of these units into some sequence. Pedagogy is a teaching theory rather than a learning theory and is usually based on transmission.
>
> (McAuliffe, Hargreaves, Winter, & Chadwick, 2008, p. 2)

This definition has many connections to instructivism; however, constructivist and even connectivist learning activities are possible when following a pedagogical methodology. As constructivism and connectivism have gained adherents in the educational world, methodologies different from pedagogy have gained popularity as the means to allow those epistemologies to reach their fullest potential. This section will briefly outline two of the more recent methodologies that offer alternatives to pedagogy.

Andragogy was a term coined and a methodology proposed in the 1960s as a way to distinguish adult education from grade school education (Merriam, 2001). In that context, an adult learner was seen as one who

> (1) has an independent self-concept and who can direct his or her own learning, (2) has accumulated a reservoir of life experiences that is a rich resource for learning, (3) has learning needs closely related to changing social roles. (4) is problem-centered and interested in immediate application of knowledge, and (5) is motivated to learn by internal rather than external factors. (p. 5)

Richard Cullata suggests that "[i]n practical terms, andragogy means that instruction for adults needs to focus more on the process and less on the content being taught. Strategies such as case studies, role playing, simulations, and self-evaluation are most useful. Instructors adopt a role of facilitator or resource rather than lecturer or grader" (2013).

As societal expectations of educational systems have changed, many would suggest that the characteristics of learners originally associated with adult learners apply to young learners engaged in grade school education as well. Even though their life experience is more limited, self-motivated junior high students might just as easily benefit from self-directed learning that draws upon their life experiences to examine changing social roles in a manner that is applicable to their own lived experiences. Therefore, andragogy has ties to constructivism in that andragogy assumes and leverages the fact that learners draw upon experience to construct new knowledge that they connect to existing knowledge in ways applicable to real life situations.

Heutagogy is a newer epistemology that combines pedagogy with andragogy to form a modern learning design. Hase and Kenyon (2000) describe heutagogy as looking "to the future in which knowing how to learn will be a fundamental skill given the pace of innovation and the changing structure of communities and workplaces" (p. 2). Blaschke (2012) also states

> [i]n a heutagogical approach to teaching and learning, learners are highly autonomous and self-determined and emphasis is placed on development of learner capacity and capability with the goal of producing learners who are well-prepared for the complexities of today's workplace. (p. 1)

Concepts that are connected to heutagogy include self-directed learning, double-loop learning, non-linear learning processes, and learning how to learn. The main idea behind heutagogy is that learners are not taught *what* to learn, but *how* to become a learner in relation to ongoing learning of a particular topic or skill set.

Most experienced course designers will recognize elements of all three methodologies in almost all classrooms and online courses. However, most courses probably lean heavily on one methodology to the relative exclusion of others, the most common methodology being pedagogy. When analyzing the methodological focus of a new MOOC, it is important to consider how course goals might suggest the best underlying course methodology to adopt, rather than basing the choice of methodology solely on instructor preference. The next section will look at combining power structures with methodology to determine an overall design of a MOOC.

ANALYZING MOOC GOALS FOR METHODOLOGY

Once a designer has determined the epistemological power structure most appropriate to the goals of a given MOOC, the next step is to decide which methodological design theory aligns best with those course goals. If the goal is to pass along formal information about a specific topic (a goal served well through an instructivist epistemology), then pedagogy likely would be the best methodology to adopt. If the goal of a course is to provide learners with experiences that expand upon their existing, informal knowledge (a goal which suggests a constructivist epistemology), then andragogy would be a good matching methodology. If the course goal is to have learners determine how to learn about an evolving topic (likely involving connectivist epistemology), then heutagogy might be the best option as the matching methodology. However, the connection between the design theory and epistemologies may not be as easy to determine as this.

For example, a course on emerging technologies might best benefit from learners learning how to keep up with an ever-changing field. The first thought would be to create a connectivist course through a heutagogical process. For certain advanced learners, this may work out well. However, if the course is expected to draw in a large number of learners that are completely new to the topic, they may need an instructivist approach to learning how to learn about emerging technology. In other words, the main goal would be to take the epistemological power structure that best facilitates comprehension of the topic or gaining of skills and match that up with the methodological design theory that will best help learners accomplish the intended learning goals, objective, or competencies. Therefore, one could possibly end up with nine outcomes, outlined below. Please note that these are general ideas that tend to blend into one another.

Instructivist Pedagogy The most common form of education in formal classrooms. Formal learning that depends on the instructor to dispense knowledge that is new to learners. Focused on content, video, standardized tests, papers, and instructor-guided discussions.	**Instructivist Andragogy** A less common form of continuing education. Experienced learners are heavily guided through discussion activities to add to existing knowledge. Instructors guide learners through lessons learned by other experienced people in the field.	**Instructivist Heutagogy** Probably a very unlikely direction to take, but this would basically be an expert sharing information about where to learn about a topic. Contains mostly lists of resources and professional communities that learners can join into to learn more, as well as instructions on how to best interact with resources and communities.
Constructivist Pedagogy Here, the goal of learning is for learners to build upon existing knowledge and experiences by formally learning from more experienced others individually or as a group. Another common formal educational design most often seen in reflective classrooms. Instructors create scenarios and activities for learners to reflect on what they know and construct new knowledge in their own ways. Writing, blogging, and reflective activities of all types are most common.	**Constructivist Andragogy** The goal of learning is for learners to build upon existing knowledge and experiences to construct new knowledge either individually or as a group. Probably the most common form of continuing education. Group work, open-ended reflection or discussions, and project-based learning are common types of activities.	**Constructivist Heutagogy** The goal of learning is for learners to construct a way to learn about a topic either individually or collectively as a group. A very complex design that is not often attempted. Ill-structured problem-based learning, open-ended group activities, and web searches focused on how to learn more than what facts to learn about a topic are possible activity types.
Connectivist Pedagogy The goal of learning is to work as a network in a formal manner for the purpose of mastering competencies to solve an ill-defined problem as proposed by the instructor. The instructor's knowledge would be the main focus and driving force behind this design.	**Connectivist Andragogy** The goal of learning is to work as a network in an informal manner to accomplish a competency that might be somewhat suggested by the course or instructor, but is ultimately determined by the group and based on expanding upon life experiences.	**Connectivist Heutagogy** The goal of learning is to work within a network to figure out how to become a learner about a topic. The instructor might create the avenue for connections and then become one equal part of the network. Also encompasses the rhizomatic model of education, wherein curriculum is "constructed and negotiated in real time by the contributions of those engaged in the learning process" (Cormier, 2008, p. 3).

In some cases, specific predetermined course activities or outcomes guide the designer's decision regarding the appropriate pairing epistemology/methodology. For example, certain subject areas may require learners to form new knowledge by writing reflectively on life experiences. This would fall into the constructivist andragogy quadrant. Given this fixed overall course design decision, the MOOC designer might decide to construct all or more aspects of the course in constructivist andragogic manner (perhaps considering group work or problem-based learning to help learners build on life experiences with the help of others, for example). The topic of another course might require learners to network with others to find social answers to problems, but the process might be a new one that requires guidance from the instructor. Therefore, the course could be designed in a connectivist pedagogical manner (for example, involving activities in which the instructor guides learners into online networks wherein learners work on social issues).

Again, note that any course will probably drift among different epistemology /methodology combinations. At the early stage of course design analysis the goal is to determine the most common way the new MOOC will serve learners' needs. Since MOOCs are open to all who register, they often draw in learners from very diverse experience levels. Often it is possible to design MOOCS with elements of, for example, instructivist pedagogy for the new learners and connectivist heutagogy for the most experienced learners. Designing with pathways that accommodate the needs of various levels of learners requires substantial planning but is achievable (Crosslin, 2014).

Once a MOOC has a general direction for epistemology and methodology, the final stage to consider before jumping into later stages of design is how to communicate aspects related to various activities and expectations in the MOOC. Improper communication of the intended power structure or theoretical design could lead to learner confusion. Therefore, establishing how information is to be communicated in a MOOC forms the final step in analyzing the basic structure for a new MOOC.

COMMUNICATION IN LEARNING

Most educators would agree with Gavriel Salomon, who wrote in 1981 that "education depends upon acts of communication" (as quoted in Anderson & Garrison, 1998, p.98). However, often little attention is given to communication in the analysis stage of course design. This may be because most educational communication occurs in coursework involving one-way instructivism, transmitting content from the instructor to the learner (Anderson & Garrison, 1998.) Some estimates place this form of communication as the commonly utilized method by 70-90% of university professors (Onyesolu, Nwasor, Ositanwosu, & Iwegbuna, 2013). Anderson and Garrison (1998) point out that

educational communication should take on many other formats, including interactive and collaborative communication modes. Therefore, the analysis stage of MOOC design should seek to examine what types of communication and interaction are optimal for a course that is not well served by instructivist-only communication patterns.

From among the many theories of communication and interaction that inform instructional design, this paper will examine one of many prominent classification systems for interaction in education, as well as one theory that classifies types of communication in education. Other communication issues, including communicating across cultures (Cortazzi, & Jin, 1997), are also important for MOOC design, but fall outside of the scope of this article. Moreover, different theories and classification methods might also work just as well within MOOC design work. The main idea would be to examine how interactions will occur within a MOOC, and to determine what needs to be communicated for accomplishing those interactions, and how to best accomplish that communication. Moore (1989) identified three types of interaction in education: student-teacher, student-student, and student-content. Hillman, Willis, and Gunawardena (1994) expanded on this model, adding student-interface interactions. Four years later, Anderson & Garrison (1998) added three more interaction types to account for advances in technology: teacher-teacher, teacher-content, and content-content. Social constructivist theory does not quite fit into these seven types of interaction, thereby leading Dron (2007) to propose four more types of interaction: group-content, group-group, learner-group, and teacher-group. More recently, proponents of connectivism have posited patterns of "interactions with and learning from sets of people or objects [which] form yet another mode of interaction" (Wang, Chen, & Anderson, 2014, p. 125). Therefore, over time, theorists have proposed twelve types of communication that could potentially occur in a distance education setting such as a MOOC:

- **student-teacher** (ex: instructivist lecture, student teaching the teacher, or student networking with teacher)
- **student-student** (ex: student mentorship, one-on-one study groups, or student teaching another student)
- **student-content** (ex: reading a textbook, watching a video, listening to audio, or reading a website)
- **student-interface** (ex: connectivist online interactions, gaming, or computerized learning tools)
- **teacher-teacher** (ex: collaborative teaching, cross-course alignment, or professional development)
- **teacher-content** (ex: teacher-authored textbooks or websites, teacher blogs, or professional study)

- **content-content** (ex: algorithms that determine new or remedial content; artificial intelligence)
- **group-content** (ex: constructivist group work, connectivist resource sharing, or group readings)
- **group-group** (ex: debate teams, group presentations, or academic group competitions)
- **learner-group** (ex: individual work presented to group for debate, student as the teacher exercises)
- **teacher-group** (ex: teacher contribution to group work, group presentation to teacher)
- **networked with sets of people or objects** (ex: Wikipedia, crowd-sourced learning, or online collaborative note-taking)

Most online courses will contain more than one of these types of interaction. Moreover, the nature of specific instances of each interaction type could be classified as exemplifying one of several different epistemologies. For example, student-teacher interactions could be instructivist if the teacher is giving a lecture, but could be constructivist if the learner is helping to teach the instructor or even connectivist if the student is bringing the teacher into a networked learning experience.

Once the typologies of interaction are determined for a MOOC, the final step before designing course activities would be to determine the form of communication needed to communicate each activity appropriately. For these determinations, Learning and Teaching as Communicative Actions (LTCA) theory provides a strong foundation. LTCA is based on the work of Jurgen Habermas. Warren and Wakefield (2012) describe LCTA theory as a system that governs "the transmission, reception, critique, and construction of communicated knowledge" (p. 101). Current LTCA theory proposes four types of communicative actions (Wakefield, Warren, Rankin, Mills, & Gratch, 2012).

- Normative communicative actions: communication of knowledge that is based on past experiences (for example, class instructions that explain student learning expectations).
- Strategic communicative actions: communication through textbooks, lectures, and other methods via transmission to the learner (probably the most utilized educational communicative actions).
- Constative communicative actions: communication through discourses, debates, and arguments intended to allow learners to make claims and counterclaims (utilizing social constructivism and /or connectivism).

- Dramaturgical communicative actions: communication for purposes of expression (reflecting or creating artifacts individually or as a group to demonstrate knowledge or skills gained).

All of these communicative actions can be matched with various types of interactions, methodologies, and epistemologies depending on the desired outcomes of the MOOC. The design challenge is to select the kind of communicative action that is best for each activity, and then to use that action type to accomplish clear communication. For example, if MOOC design calls for a course debate activity, communicating the parameters of the debate through highly normative communication that suggests the instructor intends to control the process could effectively shut down any debate. On the other hand, debate over a topic that is new to learners might not occur at all if the learners are not given sufficient background knowledge through strategic communication.

ANALYZING MOOC GOALS FOR COMMUNICATION

Analysis of communication and interaction is the phase of design analysis that bleeds into decision-making regarding design details. The designer must consider specific learning activities in order to determine proper types of interaction and communicative actions. The first place to start in analyzing communication is to determine what types of interaction will be occurring most often in a MOOC. Most courses have more than one type of interaction, so this analysis could take the form of a list of several activities instead of determining one "correct" type. The activity that students are to accomplish will determine which of the twelve types of interaction are appropriate for a given learning objective, and most interactive types can be used in all epistemological designs and all methodologies. However, communicative actions are more specific as to the type of learning situation in which they can be utilized effectively. Normative and strategic communicative actions are most suitable for instructivist transfer of knowledge or for explaining directions that guide learners into constructivist or connectivist activities. In pedagogical methodologies, these actions often take the form of learner experiences with lectures and textbooks (strategic) and reference to syllabus instructions (normative). In andragogic methodologies, these actions are typically reserved for creating an atmosphere that encourages learners to share existing knowledge. In heutagogical methodologies, these normative and strategic communicative actions typically operate within instructions designed to guide learners to discover how to be learners in a specific context. Constative communications support discourse and debate, most commonly in constructivist or connectivist designs. In pedagogical methodologies, the instructor would guide constative actions in order to bring students to a pre-determined conclusion or to support knowledge transfer. In andragogic methodologies, constative actions

would be designed to allow learners to use existing knowledge to guide discourse. In heutagogical methodologies, constative actions would be designed to help learners create their own learning experience out of debate. Dramaturgical communicative actions support artistic expression by groups or individuals. In pedagogical methodologies, the instructor would determine the form of expression. In andragogic and heutagogical methodologies, the learner would determine the form of expression.

Consider a new MOOC that covers an emerging idea in a specific field. Assume that, through design analysis, the course designer has determined that instructivism is the best governing epistemology for the course, and has determined that pedagogy is the best primary methodology. Given these design analyses, course activities would be based on student-teacher interactions, but also likely would involve some teacher-group guided group work debates. This course would then require normative and strategic communicative actions for the instructivist pedagogical student-teacher interactions, as well as a mixture of some normative with mostly constative communicative actions for the instructivist pedagogical teacher-group interactions. At the end of the MOOC, the designer might decide to mix it up a bit and add a constructivist andragogic student-interface interaction wherein students would use dramaturgical communicative actions to reflect in a blog-type entry on the connections between their own professional experiences and what they have learned in the MOOC. Clarifying to this level of detail in the analysis stage forms a road map that clarifies and simplifies course design immensely. As noted earlier, the worksheet provided in Appendix A could be helpful in organizing these various ideas into a coherent design document.

CONCLUSION

The goal of this article is to start an investigation into theoretical ideas not often considered in the course design process. The analysis procedure described is not exact science. The hope here has been to provide some guidelines to help MOOC designers think through the various aspects of course design through useful theoretical lenses. Many of the ideas and concepts covered here have been greatly simplified, and no doubt experts in those fields would point out important nuances that are omitted here. Designers will want to conduct their own research to gain deeper understanding of the rich theoretical positions touched upon in this article. MOOC designers who apply the design analysis method proposed are encouraged to re-order, re-mix, or re-think any part of the process that does not fit the parameters of their design work, and are further encouraged to report outcomes and innovations to the growing community of MOOC designers.

REFERENCES

Andersen, R., & Ponti, M. (2014). Participatory pedagogy in an open educational course: challenges and opportunities. *Distance Education, 35*(2), 234–249.

Anderson, T., & Dron, J. (2010). Three generations of distance education pedagogy. *The International Review of Research in Open and Distance Learning, 12*(3), 80-97.

Anderson, T., & Garrison, D. R. (1998). Learning in a networked world: New roles and responsibilities. In C. Gibson (Ed.), *Distance learners in higher education* (pp. 97-112). Madison, WI.: Atwood Publishing.

Blaschke, L. M. (2012). Heutagogy and lifelong learning: A review of heutagogical practice and self-determined learning. *The International Review of Research in Open and Distance Learning, 13*(1), 56-71.

Cormier, D. (2008). Rhizomatic education: Community as curriculum. *Innovate 4*(5).

Cortazzi, M., & Jin, L. (1997). Communication for learning across cultures. *Overseas students in higher education: Issues in teaching and learning*, 76-90.

Crosslin, M. (2014, May 4), Designing a dual layer cMOOC/xMOOC [Web log]. Retrieved from http://www.edugeekjournal.com/2014/05/04/designing-a-dual-layer-cmoocxmooc/

Cullata, R. (2015). Andragogy (Malcolm Knowles). Retrieved March 04, 2016, from http://www.instructionaldesign.org/theories/andragogy.html (A Publication of Instructionaldesign.org.)

Dron, J. (2007). *Control and Constraint in E-Learning: Choosing When to Choose*. Hershey, PA: IGI Global. doi:10.4018/978-1-59904-390-6

Habermas, J. (1971). *Knowledge and human interests*. Boston: Beacon Press.

Hase, S., & Kenyon, C. (2000). From andragogy to heutagogy. *Ultibase Articles, 5*(3), 1-10.

Hillman, D. C. A., Willis, D. J., & Gunawardena, C. N. (1994). Learner-interface interaction in distance education: An extension of contemporary models and strategies for practitioners. *American Journal of Distance Education, 8*(2), 30-42.

McAuliffe, M. B., Hargreaves, D. J., Winter, A. J., & Chadwick, G. (2008). Does pedagogy still rule? In: *19th Annual Conference of Australasian Association for Engineer Education*, 7-10 December 2008, Central Queensland University, Yeppoon.

Merriam, S. B. (2001). Andragogy and self-directed learning: Pillars of adult learning theory. *New directions for adult and continuing education, 2001*(89), 3-14.

Moore, M. (1989). Three types of interaction. *American Journal of Distance Education, 3*(2), 1-6.

Onyesolu, M. O., Nwasor, V. C., Ositanwosu, O. E., & Iwegbuna, O.N. (2013). Pedagogy: Instructivism to socio-constructivism through virtual reality. *International Journal of Advanced Computer Sciences and Applications, 4*(9), 40-47.

Porcaro, D. (2011). Applying constructivism in instructivist learning cultures. *Multicultural Education & Technology Journal, 5*(1), 39. doi:10.1108/17504971111121919

Siemens, G. (2005). Connectivism: A learning theory for the digital age. *International Journal of Instructional Technology and Distance Learning, 2*(1), 3-10.

Yukl, G. (2006). *Leadership in organizations* (6th ed.). Upper Saddle River, NJ: Pearson.

Vygotsky, L.S. (1978). *Mind in society. The development of higher psychological processes.* Cambridge, MA: Harvard University Press.

Wang, Z., Chen, L., & Anderson, T. (2014). A framework for interaction and cognitive engagement in connectivist learning contexts. *The International Review of Research in Open and Distance Learning, 15*(2). 121-141.

Wakefield, J. S., Warren, S. J., Rankin, M. A., Mills, L. A., & Gratch, J. S. (2012). Learning and teaching as communicative actions: Improving historical knowledge and cognition through Second Life avatar role play. *Knowledge Management & E-Learning: An International Journal (KM&EL), 4*(3), 258-278.

Warren, S. J., & Wakefield, J. S. (2012). Learning and teaching as communicative actions: social media as educational tool. In K. Seo (Ed.), *Using social media effectively in the classroom: Blogs, wikis, Twitter, and more* (pp. 98-113). Routledge: Francis & Taylor, Inc.

APPENDIX A: MOOC DESIGN ANALYSIS WORKSHEET

1. Main epistemological power structure (circle one)

   Instructivist *Constructivist* *Connectivist*

   What is the main reason for this selection?

   _____

   What other power structures could also possibly be part of the course design?

   _____

2. Main methodological structure (circle one)

   Pedagogy *Andragogy* *Heutagogy*

   What is the main reason for this selection?

   _____

   What other methodologies could also possibly be part of the course design?

   _____

3. Main types of interaction (from the 12 types of interaction)

   Interaction *Epistemological and Methodological Match*

   _____ _____

   _____ _____

   _____ _____

4. Activity and Communicative Actions Map

   Activity *Communicative Action* *Epistemological and Methodological Match*

   _____ _____ _____

   _____ _____ _____

   _____ _____ _____

   (add more as needed)

CLOSING THE LOOP:
BUILDING SYNERGY FOR LEARNING THROUGH A PROFESSIONAL DEVELOPMENT MOOC ABOUT FLIPPED TEACHING

Donna Harp Ziegenfuss
University of Utah

ABSTRACT
This case study describes how a MOOC, funded through an NSF grant, was used to create and assess faculty professional development. The MOOC, designed and developed using a backward design process, guided participants through an online project-based learning experience that integrated learning about the flipped classroom and about how to flip a classroom as the participants designed flipped teaching materials. The course structure involved an introduction to flipped teaching and learning content, experimented with flipped ideas and concepts, and emphasized reflection and sharing of experiences with peers.

Although mentoring faculty in flipped pedagogical design was the primary MOOC goal, the project also provided insights about assessing the MOOC and the personal learning experiences of MOOC participants. MOOC developers concluded that, depending on the purpose of the MOOC, course designers and instructors may need to rethink what they are assessing, and broaden their perspectives regarding how to assess what is important. Closing the assessment loop and monitoring continuous improvement may be alternative strategies for assessing learning, boosting MOOC effectiveness, and documenting conceptual change.

KEYWORDS: MOOC, faculty development, flipped classroom, flipped teaching, course design, backward design

CLOSING THE LOOP:
BUILDING SYNERGY FOR LEARNING THROUGH A PROFESSIONAL DEVELOPMENT MOOC ABOUT FLIPPED TEACHING

Donna Harp Ziegenfuss[xv]
University of Utah

INTRODUCTION

Higher education in the US is often criticized for being too embedded in tradition and therefore lacking the ability to change or innovate (Chandler, 2013; Deneen & Boud, 2014; Lucas, 2000). However, one factor prevalent in the higher education change literature is that successful change demands that active and engaged faculty be included in the planning and implementation of university change initiatives (Gaff, 2007; Ferren, Dolinsky, & McCambly, 2014; Kezar, 2012). This case study presents a technology-based professional development project that was spearheaded by one such engaged faculty member who led a change initiative through a National Science Foundation (NSF) grant on our campus. This faculty member, Dr. Cynthia Furse, the Associate Vice President for Research and a professor of electrical and computer engineering, had experience in flipping her courses. Unable to personally sustain providing support for the increasing number of faculty interested in teaching in a flipped format, she had reached a tipping point.

A flipped classroom is a hybrid course environment in which the classroom-homework paradigm is reversed. Students watch lectures online and read materials for homework before coming to class. Preparing in advance enables students to participate in active learning activities such as homework problem-solving, group projects, and analyzing case studies (Bishop & Verleger, 2013; Hwang, Lai & Wang, 2015; Roehl, Reddy & Shannon, 2013). Relative to standard classroom practices, a flipped classroom strategy requires a more engaged and self-directed learner, one willing to accept more responsibility for personal learning outside the classroom and willing to be an engaged participant in active learning activities during class.

In order to create a sustainable flipped classroom adoption model, Dr. Furse reached out to a librarian, another local institution, and several campus support units to collaborate on creating a local campus STEM faculty professional development seminar. This seminar eventually evolved into an interdisciplinary

online Massive Open and Online Course (MOOC) course engaging thousands of international faculty and staff. Our interest in extending the conversation beyond the STEM community to include additional international, K-12, and corporate training perspectives in the MOOC led us into a rich discourse around the challenges and opportunities of the flipped classroom.

Integrated course design with a focus on assessment was one of our primary goals of the Flipped Teaching MOOC project. The backward course design model used to create the Flipped Teaching MOOC is the same model faculty and staff participating in the MOOC used as they designed their own flipped instruction. Unlike traditional xMOOCs (Taneja & Goel, 2014), which are designed to manage the movement of a very large number of students through linear course content using quizzes and tests, this MOOC was designed as a project-based cMOOC (Cochrane, Narayan, & Burcio-Martin, 2015) with the purpose of engaging faculty and staff in the authentic task of designing flipped instruction. Documenting MOOC course improvement, participants' flipped teaching practice, and reflections about change in teaching, this project uncovered needs and strategies for alternative MOOC evaluation, led to the development of flipped teaching assessment tools, and exposed alternative instruments to measure and monitor faculty growth and change. MOOC participants took a pre- and post-course survey using an instrument called the CBAM, or Concerns-Based Adoption Model (Hall & Hord, 2015; Hord, 1987; Horsley & Loucks-Horsley, 1998), to measure how their thinking and concerns about flipping changed throughout the course. Data collected with this instrument has been used in both K-12 and higher education contexts to plot a visual CBAM profile that demonstrated to participants how their concerns about flipping changed during the MOOC. (Hodges & Nelson, 2011; Marcu, 2013).

One of the most popular and rewarding aspects of the MOOC was providing support and feedback for two components of flipping instruction: creating online lecture videos, and designing engaging active learning activities for applying course content. MOOC participants shared ideas, experiences, and expertise and provided peer feedback for others testing the waters of online video creation. By learning more about faculty needs, motivational triggers, and mind-sets that impacted learning, we uncovered new ways to steer the synergy toward the ultimate goal of engaged teaching and hopefully improved student learning in the future. One participant commented, "… I've been aware for a long time that I have not received enough education in teaching, and I've wanted to address that. … In some ways, this material helped me improve on things I didn't know I needed to improve, like learning outcomes taxonomies! Who knew!"

This case study will present the process for using the MOOC as a professional development learning environment for instructors testing the boundaries between teaching pedagogy, technology tools, and active learning

environments / communities. As participants reflected on their teaching practice and interacted with other faculty rethinking their teaching practice, they discussed how they were developing a more holistic perspective of their teaching. One participant said, "I have a better understanding of how I would like to change my teaching system." In the MOOC discussed in this case study, entitled *Teaching Flipped (*http://teach-flip.utah.edu/), the parallel paths of pedagogical teaching approaches, educational technology implementation, and being part of a community of international learners created a synergy for learning that would not have been possible in a traditional local and face-to-face professional development workshop format.

RELEVANT LITERATURE

Before moving on to a more detailed discussion about the process of the MOOC design and participant experience, it is useful to review some of the most seminal and relevant teaching and learning trends contributing to the synergy of this MOOC project. The two main trends in the teaching and learning literature relevant to this MOOC are: (1) the pedagogical foundations of teaching and learning (including paradigm shifts, course design and active learning), and (2) the emerging technology-enhanced learning environments and tools.

PEDAGOGICAL FOUNDATIONS

Designing content, contexts, and environments for learning engagement at multiple levels requires a rigorous approach to instruction design. Emerging interests in course and curriculum design, instructional design, and assessment are inspiring new ways of thinking about teaching pedagogy and how students learn (Ambrose, Bridges, DiPietro, Lovett, & Norman, 2010; Beetham, & Sharpe, 2013). Many examples of instructional design models exist in the literature and provide conceptual frameworks for the process of designing instruction such as the ADDIE model (Allen, 2006), the understanding-by-design model of Wiggins and McTighe (2005), and the model of constructive alignment (Biggs & Tang, 2011). However, the backward design model of Fink (2003, 2013) that focuses on the alignment of learning outcomes, assessment, and teaching and learning activities is the model used for the designs of the MOOC and the participants' flipped learning activities. In *Creating Significant Learning Environments: An Integrated Approach to Designing College Courses*, Fink claims that "faculty knowledge about course design is the most significant bottleneck to better teaching and learning in higher education" (p. 26). My experience in working with many faculty across a variety of disciplines supports Fink's claim. Fink's book and the concept of backward design and alignment have drastically changed my own conceptions about teaching and learning both as an instructional designer helping others design courses, and when designing my own courses. A course

using the Fink model designed for graduate students on how to design online courses (www.youtube.com/watch?v=qqHXczNYtlg) is now used as the foundation for building an institution-wide model of course design on our campus. This adapted Fink model, the QCF, or Quality Course Framework, (http://qcf.utah.edu), was used to design, develop, and implement this MOOC. It is also used to teach MOOC participants how to flip their courses and instruction.

Technology-based flipped instruction, which originated in the K-12 context in 2006 (Bergmann & Sams, 2008), was one of the *Important Developments in Educational Technology for Higher Education* spotlighted in the 2014 New Media Consortium Report (Johnson, Becker, Estrada & Freeman, 2014) available online at http://www.nmc.org/publication/nmc-horizon-report-2014-higher-education-edition/. However, flipping the classroom, although considered a new teaching strategy, is really not new at all because instructors have always expected students to come to class prepared to engage in the course content. A seminal article by Barr and Tagg in 1995 used the phrase "shifting from an instruction paradigm to a learning paradigm" and refers directly to this new flipped classroom paradigm in which students are expected to take more responsibility for their own learning and "discover and construct knowledge for themselves" (p. 15).

When shifting from a paradigm of teaching to learning, the learning environment also demands a more active approach to learning that engages students in the learning process and assesses outcomes, not inputs. Emerging literature is documenting the success of active learning strategies in the classroom, especially in the sciences (Freeman, Eddy, McDonough, Smith, Okoroafor, Jordt, & Wenderoth, 2014). Literature on classroom strategies that engage students actively in the learning process is becoming more critical to the success of the flipped classroom, which calls for new standards of teaching practice. Those standards include additional options for engagement and assessment of learning. (Bonwell & Eison, 1991; Silberman, 2007). Transitioning to an active teaching approach, and moving responsibilities for learning course content out of class and onto the student, require adjustments to assessment and evaluation strategies such as a shifting from summative to formative assessment. They also require measuring performance and application, not just knowledge, as well as implementation of rubrics and learning reflections.

TECHNOLOGICAL CHANGES

Tied closely to these evolving pedagogical approaches are emerging technology tools and solutions designed specifically to enhance the classroom experience, facilitate more efficient and effective teaching environments, and engage students in the learning process. Emerging technologies, tools, and online learning environments are creating new opportunities for experimentation and innovation (Siemens, 2013). Over the past several decades, learning technology has steadily been evolving and emerging as a driving force for change in higher education.

Although technology develops and grows independent of pedagogical change, the parallel paths often intersect and work to amplify each other. The literature frequently refers to these innovative technology-based tools and learning environments as "disruptive forces" in higher education (Christensen & Eyring, 2011; Christensen, Horn, & Johnson, 2008; Conole, DeLaat, Dillon & Darby, 2008; Hyman, 2012). New and innovative technologies such as gamification, mobile learning, and personalized learning technologies are enabling new ways to look at formative and summative assessment tools, research tools, animated learning activities enhancements, and the integration of social media into teaching and learning. Technology-enabled learning environments such as online learning, massive open online courses (MOOCs), hybrid or blended courses, and the hyflex classroom (Beatty, 2007), where online and face-to-face learning experiences take place simultaneously, all coexist in this exciting and technologically charged educational context. In addition, technology tools and online learning environments are being heralded as possible solutions to make teaching and learning more efficient, effective, interactive, and collaborative (Breen, Lindsay, Jenkins & Smith, 2001).

One fairly recent innovation especially relevant to this project are Massive Open Online Courses, commonly known as MOOCs. MOOCs have intrigued many instructors in both the K-12 and higher education contexts and have been hailed early on as a possible magic bullet remedy for higher education challenges. Some have touted the MOOC as the innovation that would change higher education forever (Harde, 2013; Leckart, 2012). Described as the ultimate "educational disruptor," MOOCs have received a lot of attention, criticism, and praise; however, the literature around these technology tools or learning environments is still too new to measure if the initial hype and claims are really true (Kelly, 2014). MOOCs can serve as a test tube environment for helping faculty mix together other emerging technologies, such as Open Educational Resources (OERs) (Shank, 2013) and automated assessment systems (Balfour, 2013). Institutional and state financial constraints, often resulting in diminished physical learning spaces, have also contributed to the increased interest in online and hybrid course alternatives to allow for more effective campus classroom space utilization and new tuition revenues, as well as the sharing and reuse of educational content (Moore, 2005).

Research, case studies, and narratives about MOOCs in a variety of disciplines, circumstances, and learning contexts are emerging in the online learning, teaching, and disciplinary literatures (Kim, 2015; Liyanagunawardena, Adams, & Williams, 2013). Although the claims about MOOCs becoming the most important educational innovation of all time have not come to fruition as predicted (Bartholet, 2013; Kim (Ed.), 2014; Kolowich, 2013), MOOCs have sparked innovation in online learning and practices, and triggered a revived

interest around pedagogy and instructional design. Kim (2015) states, "Even though MOOCs may not live up to all of the initial hype that accompanied them, and we are still trying to figure out the best way to use them, there is no doubt that they are an important new innovation with the potential to have a large impact" (p. 9). MOOCs have also generated new technology tools, technology companies, and business models (Haggard, Brown, Mills, Tait, Warburton, Lawton, & Angulo, 2013).

SPARKING SYNERGY THROUGH COMBINING PEDAGOGICAL DESIGN AND TECHNOLOGICAL TOOLS

PEDAGOGICAL DESIGN COMPONENT

Through the identification of a perceived teaching and learning need, a faculty development project idea emerged on our campus that focused on rethinking how faculty teach STEM courses. Campus conversations about the need to engage students differently in STEM classrooms, improve STEM education outcomes, and engage and retain STEM majors resulted in new partnerships, new skills and tools, and new pedagogical approaches. Dr. Furse experimented with the flipped classroom, recording engineering lectures and making them available online so students could view them before coming to class. This practice freed up in-class time for problem solving, social learning activities, collaborative group interactions, and a higher level of application of the course content. Formative data collected every three weeks documented the value-added advantage of the flipped class format for students. Students reported a richer and more personal connection to the instructor, the added value of video lectures that could be viewed over and over for studying and preparing for exams, and a developing awareness for time management and new study skills. Wanting to share her experience and expertise with other faculty, Dr. Furse brought the author, a librarian with course design and pedagogical experience, into the project to help ground the changing and evolving course in teaching and learning theory. We obtained funding from the National Science Foundation to provide professional development for STEM faculty on how to flip courses based on the flipped experiences of this engineering professor and faculty change advocate.

A MOOC was not in the original grant plan. However, over a two-year cycle of assessment, course re-design and evaluation, a local faculty development plan for helping STEM faculty flip their courses evolved into creating and facilitating an online international learning community of faculty learners flipping instruction from many disciplines and contexts such as K-12, higher education, and corporate training. For this particular case scenario, the MOOC proved to be the flexible experimental context we needed to create our own synergy resulting in new approaches to faculty development, new tools and strategies for teaching, and new partnerships for supporting faculty development on our campus.

This project did not focus just on the technology tools needed to flip the classroom, or just on the MOOC learning environment, or just on the particular pedagogical strategy of flipping the classroom. Instead, the real value of this project centered on building synergy around the benefits of aligning explicit pedagogical outcomes within the technological innovation of a MOOC. The intersection of compelling content grounded in pedagogical principles while supporting and experimenting with technology tools to create online videos magnified the MOOC experience. Both pedagogy and technology must be integrated to have a successful learning experience and technology integration (Laurillard, 2013; Mishra & Koehler, 2006; Moore, Fowler, & Watson, 2007). The need is to "pour a solid pedagogical foundation before adding in the layer of technology" (Ziegenfuss, 2005). The process and strategies we used for designing the MOOC as an online learning community, grounded in the integration of pedagogy and technology, evolved over two years. We collected and analyzed course formative and summative assessment data, redesigned online modules, integrated lessons learned, and focused in on our overarching purpose of providing an experiential learning context for flipping the classroom for faculty who were rethinking their teaching practice and reflecting on how their students learned.

THE MOOC PROCESS AND ASSESSMENT CYCLE

As we worked through the process of designing the MOOC for faculty to learn about flipping the classroom, we focused on several topics:

1. A continuous process of piloting and redesigning the online modules that resulted in a continuous cycle for improvement that included formative assessment and summative assessment components.
2. Guiding participants through a project-based learning experience in which they learned about how to flip a classroom as they created flipped classroom materials and activities; reflected on the flipped experience; and shared ideas, strategies, and feedback with peers.
3. Providing a context for experimentation and trial and error.
4. Measuring change in how faculty were thinking about the flipped classroom.

The course structure, similar to the OLDS MOOC structure (Cross, 2013), involved active participation of participants with reflection and sharing of their experiences with peers. We followed an instructional design process developed collaboratively on our campus for course design called the Quality Course Framework, or the QCF, to design the MOOC course. This framework is grounded in the Fink course design model for creating significant learning experiences (2013). The model focuses on these six elements of a quality online course that are embedded into a four-step design process (Figure 1).

1. Course and lesson outcomes stated as measurable objectives.
2. An organization structure that facilitates usability and learning.
3. Learning activities engaging students in a complete learning process.
4. Course content provided in media formats appropriate for the web.
5. A sense of learning community facilitated through specifically planned communication and student support.
6. Assessment, feedback, and evaluation strategies that measure student learning outcomes as well as overall course quality.

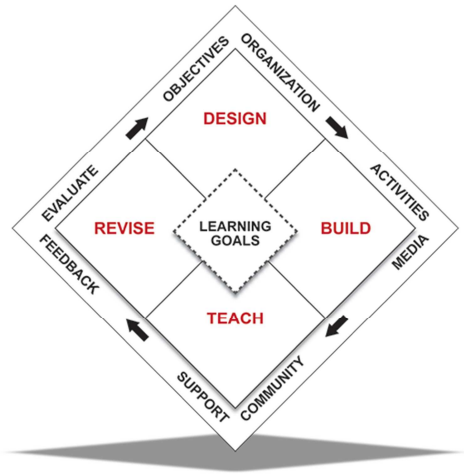


Fig. 1: The Quality Course Framework: Instruction Design Process (http://qcf.utah.edu)

The MOOC was designed in a reading/doing/reflecting framework, or an experiential approach (Kolb, 2014), so that the adult learners could integrate what they were learning with their own personal real-world course design projects. A MOOC originally designed as a 15-week semester-long course eventually evolved to a three-module six-week course based on participant feedback and pre- and post-survey data. The course developed through grant funding has now been handed over to our Teaching and Learning Center where it will continue to be offered. The model of teaching innovation incorporating active learning activities aligns well to their mission and faculty development offerings.

LESSONS LEARNED

RE-ASSESSING WHAT WE WERE ASSESSING

The most important and interesting lesson learned from this MOOC project was that we needed to expand our assessment and evaluation. By gathering pre- and post-course survey data, we discovered the wide range of participants' personal goals and expectations. Rather than measure completion rates or completed

assignments, we focused on measuring conceptual change and how the participants' thinking about "flipping the classroom" changed across the course process. Ho (2000) emphasized in her faculty development research findings the importance of creating learning communities where faculty can learn, try out, discuss, and reflect with peers as they learn about teaching practice and how students learn. We used a pre- and post-course survey called the CBAM, or the Concerns-Based Adoption Model (Conway & Clark, 2003, Hall, 1979; Hall & Loucks, 1978), an instrument that was designed to measure change in perceptions and concerns about technology innovation—or in our case, flipping the classroom. Scores from 35 questions are tallied across six different stages of concern: from stage 0, which means there is little awareness of concern or no interest in the technology innovation, up to stage 6, which is the refocusing stage where the participant reports an advanced level of knowledge about the innovation and is working at customizing or adapting the innovation for personal needs. Percentiles of the six stage scores are plotted on a graph. Below is an example of one CBAM for our MOOC class, which shows the change in thinking from the pre-course survey (red circle) to the post course survey (blue circle) (Figure 2). This CBAM example shows that the participant had overall high concerns about flipping in the pre-survey, but much lower concerns after learning about what flipping the classroom means and how it is implemented. This person now knows the personal impact of flipping and how to manage the flipped classroom, thus decreasing the level of concern in the post survey. The post-survey value that increased is in the stage of collaboration and may indicate more interest in collaborating with others.

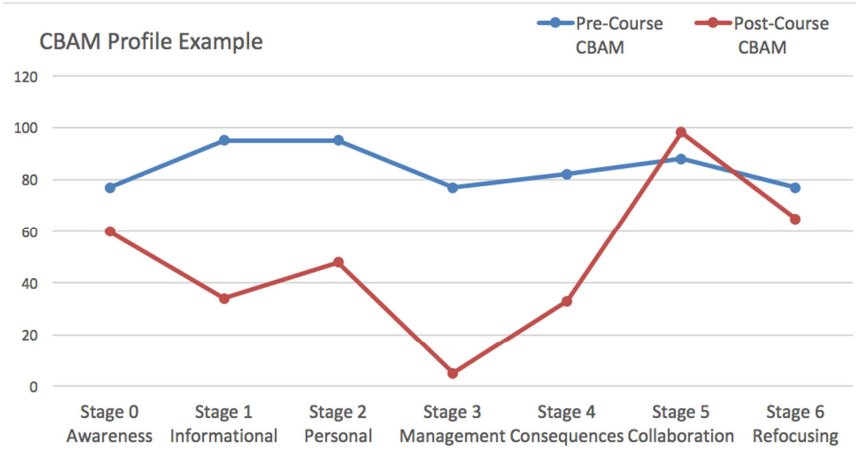


Figure 2: A pre- and post-CBAM profile of a MOOC participant.

This participant depicted in the CBAM profile above followed up with us about two months after completing the MOOC and reported, "I am already doing some flipping with one class this semester and I am currently working on my videos and writing for one of my classes next term. I am attending a technology meeting at one of the colleges where I work in December. I am looking forward to completely flipping in January!!! I learned so much from this course." Another participant who followed up after our latest version of the MOOC also stated, "I really liked the course, and I have learned so much that I feel more secure on using flipping in my classes. I have used the content learned in your class and I have used all the suggestions and strategies. I plan to give a mini-workshop to my adjuncts about flipped classroom and foreign language learning."

For two of the MOOC iterations in which we collected pre- and post-CBAM surveys, we also interviewed some participants who appeared to be "lurkers" in the course asking about their actual engagement with course content. We are still analyzing the patterns that emerged from this detailed analysis of the data, but it appears that they are interacting with course content even though they do not appear to be doing so by participating in the discussion forums and assignments. This data about how individual participants personalized their own path through the MOOC course based on their own goals and interests is just as interesting as the data we collected about the perceptions of the flipped classroom content. As we begin planning to run this MOOC again in spring 2016 we will readjust our assessment strategies as we re-design and prepare the course for the next iteration.

The largest challenge and also greatest opportunity of working through the process of designing and developing the Teaching Flipped MOOC was rethinking assessment because of the structure and context of the MOOC environment. Since there were no grades, how would the data collected evaluate whether the goals and outcomes of the course were achieved? How will we know if the course was successful or if the participants learned anything worthwhile? There is still much debate in the MOOC literature on assessing MOOCs (Daradoumis, Bassi, Xhafa, & Caballé, 2013). MOOCs are often criticized for the low MOOC completion rates, but is this really a good measure of MOOC learning? In our case, where we focused more on faculty perceptions and building confidence about flipping their courses, our assessment process had to be more personal. Instead of measuring how many participants finished all the assignments in the MOOC or the clicks in the various modules, we reflected on alternative methods for measuring how faculty were changing how they thought about flipping. We researched personal learning environments, or PLEs (Wilson, Liber, Johnson, Beauvoir, Sharples, & Milligan, 2007). We integrated principles from the adult learning literatures (Candy, 1991; Merriam, Caffarella & Baumgartner, 2012). We also structured each MOOC module into three levels with three different commitment levels so that the adult learners in this MOOC could pick and choose

the materials and time commitment that was most relevant to them. What we have discovered from the analysis of the CBAM pre- and post–profiles and other assessment measures is that the profiles are all different; there is no alignment of the CBAM with the completion of the MOOC assignments or amount of viewing of all of the MOOC module content. We need to keep searching for the best mix of assessment/evaluation strategies for assessing the true value of our Teaching Flipped MOOC.

Broadening our Perspectives and Narrowing our Scope

Since this course design project centered on professional development and was part of a National Science Foundation grant, we had to create an evaluation plan and an assessment timeline as part of our grant application. We planned for formative and summative measures that were part of a continuous cycle across the grant project. Assessment was truly embedded in the planning process and made so much more sense than what is normally done as part of a traditional course or MOOC development process.

In addition to using the QCF process as described earlier to design the MOOC, a logic model was used to create the overall plan for the Flipped Teaching MOOC project. Logic models are planning tools commonly used for grant proposal planning. The logic model created a visual map for the MOOC project. This logic model matrix then provided an opportunity to articulate resources, inputs, and output tasks, outcomes, and impacts (W.K. Kellogg Foundation, 2001). Table 1 presents an excerpt of an updated logic model created for this professional development MOOC project.

Creating the logic model provided a broader view of the project process and forced reflection about the course design in short- and long-term goals and impacts. The logic model excerpt shows how reflection on mid- and long-term goals helped us see beyond the six-week MOOC and our expectations for the result. The logic model process also created an opportunity to focus on priorities and really detail a narrow and measurable scope for some of the course outcomes. Thinking about impacts—and how to assess project sustainability—is especially important with grant proposals. Reflecting on impacts also encourages thinking beyond the boundaries of traditional outcomes. For example, measuring conceptual change and perceptions about the flipped classroom resulted from thinking and dreaming about our distant outcomes. This experience has helped us see the value of using a logic model in course design planning, a task we will continue to use for designing future courses. Another Fink tool, the “dream exercise,” can help in this broader visioning process. The dream exercise enables us to envision what students or participants will have learned, what we want them to be able to do, and what dispositions we hope they have at the end of instruction. The exercise can be found at this link. This backward process of

dreaming about outcomes helps to identify goals that can then be used to define measurable objectives and/or outcomes as the starting point for the alignment grid.

Needs and plans for preparing for the program			**Outcomes - during and after the program begins**		
Inputs / Resources *What resources will be needed*	**Activities /Tasks** *What activities or (deliverables) will be needed for completion of the project*	**Outputs / Deliverables** *Evidence of progress*	**Short Term Outcomes** *What is expected or hoped will happen in the short term during the project*	**Medium Term Outcomes** *Measurable change that will happen in the mid term*	**Impacts Or Long Term Outcomes** *Big picture outcomes/impacts*
NSF funding Use of the Quality Course Framework as the model for developing the MOOC Support and resources from TLT, Library and CTLE for video support Support from the Library for gathering OER materials for the MOOC Support from TLT for the Canvas MOOC and integrating additional online tools	Design & develop the MOOC in Canvas Design & develop tutorials and videos to help faculty flip their courses Collect data during the MOOC pilot and other implementations for continuous improvement	The MOOC will be developed and piloted with a local cohort of faculty participants Tutorials and videos will be completed and added to the MOOC Data collected from the pilot and subsequent iterations of the MOOC will be used to improve the MOOC	Through the CBAM survey, faculty will show a change in their concerns about flipping their courses Faculty will demonstrate they can create videos and active learning activities for their flipped courses Faculty will report they can now attempt to flip their courses MOOC participants report they like the new approach to teaching Faculty report they learned more than just how to flip a classroom	MOOC participants demonstrate they can design and implement a flipped classroom Faculty participants share their new knowledge with peers A successful, collaborative and sustainable MOOC model will be transferred to CTLE ownership MOOC faculty continue to use flipped classroom strategies and apply them to other courses MOOC faculty use what they have learned to successfully apply for their own grants	The MOOC becomes a respected open course that is used worldwide for helping faculty learn to flip their courses The MOOC project becomes a faculty development model that can be used by other CTLs Local MOOC faculty will win teaching awards Better course alignment between engineering courses developed at the U of U and SLCC that will improve the student transfer process

Table 1: Example of a Logic Model Excerpt for the Teaching Flipped Project

After articulating the broader vision using the logic model, we created a grid to align course outcomes to assessment, teaching demonstrations, and learning activities. As we designed and reworked the online course modules over four different iterations, we consolidated, streamlined, and adapted the course based on participant feedback. Table 2 presents an excerpt from an alignment grid for the six-module, six-week MOOC. I am in the process of redesigning the grid for our newest three-module, six-week MOOC adapting the MOOC based on participant feedback. Here is the link to the full six-week alignment grid.

Objectives/ Outcomes	Assessments	Our Presentation/ Demonstration	Online Practice with Feedback	Resources Required
WHAT IS FLIPPING ABOUT? As participants think about and **REFLECT** on their own teaching practice and gather ideas for flipping, they will learn about what a flipped course is all about and see how it work in their discipline	• Completion of CBAM, learning and teaching styles inventories • Reflection on ways they can flip their course and share with peers in discussion	**Module 1a:** Introduction to the Flipped Classroom • Overview of the course • Providing links to take surveys • Provide introductory readings and Cindy's videos about flipping • Facilitate discussion around introductory discussion	**Module 1a:** Introduction to the Flipped Classroom • Watch the online lectures about flipping • Complete surveys • Online Discussion: initial questions and comments about flipping • Online discussions for introductions and own context	• Online Lectures - Cindy's recorded flipping lecture from ID summit as an intro • Links to introductory flipped classroom articles and readings • Links to teaching, learning and CBAM surveys
WHAT ARE OTHER PEOPLE DOING WITH FLIPPING? Research good teaching pedagogy and **REFLECT** how to apply what is learned to practice with a focus on student centered learning, active learning strategies, and the flipped classroom	• Learn about search tools and strategies for the educational literature • Install a social bookmarking • Perform searches for disciplinary pedagogy-focused teaching and learning resources and examples • Share resources they find in their searching with peers	**Module 1b:** Introduction to the Education Literature • Present links to the education literature to investigate disciplinary pedagogy • Present materials on threshold concepts and student learning bottlenecks • Provide directions for downloading and installing Diigo • Facilitate discussion of questions and findings from the research	**Module 1b:** Introduction to the Education Literature • Conduct a search through a variety of different teaching and learning journals • If interested, download Diigo for more organized searching • Share some of research finds with peers	• Online lectures and OERS on: o Threshold concepts /Bottlenecks o Teaching Pedagogy o Active Learning • Tutorials on Google Scholar, and Diigo • Links to pedagogy journals

Table 2: Excerpt from the MOOC alignment grid for course planning

In addition to broadening the perspective of what is possible within a course, especially with a MOOC, begin by thinking beyond the assignments. Is the MOOC or course process based where it is possible to identify assignments or benchmarks across the process? How are assignments related or sequenced? In this MOOC, we reflected about going beyond just designing a series of assignments, or a series of "active learning" strategies cobbled together, since just layering random active learning activities onto an already full curriculum will not result in a transformational learning environment. We thought more about affective outcomes and developing a comfort level with flipping, including how to help faculty explain flipping to their students, and designed our assessments and learning activities around those priorities. This process of broadening the scope and then narrowing down to priorities was a very interesting "aha" moment for us, and one that can be adapted to designing traditional face-to-face and online courses.

Importance of Closing the Loop

Over the course of two years we have adjusted and redesigned the course structure significantly in each MOOC iteration based on participant feedback. We started with a full semester online MOOC course of 15 different one-week modules and in our last iteration we now have three modules of two weeks each for a total of six weeks. The focus on continuous improvement and tweaking content, learning activities, and assessments to meet the needs of our participants has changed what we think about "closing the loop." We have moved beyond the idea of using one measure, such as MOOC completion rate statistics, to measure the success or value of our MOOC. We have provided a personal CBAM snapshot for participants who complete both CBAM surveys to help them see and reflect on how they have changed their thinking across the MOOC experience. We now focus on closing the loop by assessing and evaluating the process of the MOOC learning, as well as how students are interacting with the MOOC content. This is not a typical "massive" undergraduate xMOOC, as is commonly discussed in the literature. With only a few thousand participants, we gleaned valuable lessons about identifying personal approaches to assignment choice and assessment. We have reimagined the course processes by utilizing the opportunities and capabilities inherent in the MOOC, not just focusing on presenting active learning strategy or classroom management techniques. Teaching in an open and international MOOC creates an engaging community of practice context including discussions, peer interaction, and sharing of expertise (Wenger, McDermott, & Snyder, 2002). We will continue to adapt and change our approach and enhance the learning community as we learn more about the needs of our MOOC participants who are interested in learning to flip instruction.

This MOOC design, development and implementation project has changed all of the MOOC creators and collaborators. We focus more now on formative assessment and try to uncover what is really going on in our course. We ask our students questions, collect feedback, analyze, and adjust our teaching based on that feedback. We think more about the affective aspects of learning, whether for faculty participants or students. We seek out instruments for measuring how our students' thinking is changing. We follow up and ask difficult questions. We have developed our qualitative analysis skills and see course analysis as something that goes beyond the numbers and analytics of MOOCs. Although first defining one's purpose and aligning that vision to outcomes seems like a logical way to design instruction, we often do not focus on this task enough. It is critical to articulate in detail the purpose of a course or MOOC and write a rationale for the course. Designing this MOOC collaboratively helped us to rethink how multiple visions can be integrated into a design and develop as an effective instructional experience.

RECOMMENDATIONS AND CONCLUSIONS

Our vision for this Teaching Flipped grant project started small with a hybrid workshop supplemented with online materials. By collecting formative data and reflecting on the participant experience, the vision quickly evolved based on our "dream" and purpose. In the beginning, we focused more on the opportunities and problems inherent in flipping the classroom or the content, and less on the design of the learning environment. Drawing on our previous MOOC and online teaching experiences, we realized we needed a more creative and flexible learning space for faculty learners. Since Dr. Furse already had many connections internationally through her YouTube videos, we knew that international perspectives would enrich and deepen faculty discussions and interactions. As our vision matured, and we uncovered new and interesting projects, technologies, and OERs available abroad, we hoped to engage those new perspectives to create the synergy for thinking differently about how faculty might learn in a MOOC learning environment. We also realized the value of learning in an open international context, and with the availability of an LMS vendor in our own backyard, Canvas.net, we received the support we needed to jump into the MOOC fray. We opted to use a MOOC environment for this project as an opportunity to help us rethink how we might provide faculty development in a new way. Instead of one-shot workshops and discussions around teaching by the same voices in our local context, we wanted an interactive experience situated in an international learning community where participants could share expertise and experiences and learn from each other.

The rich interaction, discussion, and sharing among international participants facilitated adaptations and new learning experiences for the K-12 and higher education participants. We learned we should be connecting learning theory to practice, and creating more transparency in our classroom activities and assignments so students will see our strategies and decision-making processes.

The bulk of the literature up to this point around MOOCs has been focused on the "massive" aspect of the MOOC and how institutions are capitalizing on new audiences, new finance streams, and methods for developing a business model for MOOC implementation. Other bodies of the MOOC literature focus on the technology component related to designing and creating tools that will facilitate the scalability of teaching and learning practices in this massive context. But we must also think about how we can capitalize on the opportunities inherent in the MOOC environment to help students be more successful and independent learners.

We have much work to do in creating increased support for self-directed learning opportunities and more engaging opportunities for peer-to-peer learning, as well as better alignment with competency-based outcomes. I plan to continue designing and teaching MOOCs and see what new insights and personal conceptual changes emerge. I will also continue to close the loop and experiment with new ways to adapt, customize, and utilize the opportunities of the MOOC learning environment. This experimentation and search for just the right synergy in online teaching and learning environments are becoming important, as McGrath, Mackey & Davis (2008) articulated so well:

> The professional development landscape is being redrawn as e-learning and educational technologies provide opportunities for participants to connect everyday life and formal online learning in new and dynamic ways. These connections call for authentic learning pedagogies which challenge traditional teacher/learner relationships, formal course design and assessment practices. (p. 613)

REFERENCES

Allen, W. C. (2006). Overview and evolution of the ADDIE training system. *Advances in Developing Human Resources*, *8*(4), 430-441.

Ambrose, S. A., Bridges, M. W., DiPietro, M., Lovett, M. C., & Norman, M. K. (2010). *How learning works: Seven research-based principles for smart teaching*. Hoboken, NJ: John Wiley & Sons.

Balfour, S. P. (2013). Assessing writing in MOOCs: Automated essay scoring and calibrated peer review. *Research & Practice in Assessment*, *8*(1), 40-48.

Barr, R. B., & Tagg, J. (1995). From teaching to learning—A new paradigm for undergraduate education. *Change: The magazine of higher learning, 27*(6), 12-26.

Bartholet, J. (2013). Hype and hope. *Scientific American*, *309*(2), 53-61.

Beatty, B. (2007). Transitioning to an online world: Using HyFlex courses to bridge the gap. In C. Montgomerie, and Seale, J. (Eds.), *Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications*, Chesapeake, VA: AACE, 2701-2706.

Beetham, H., & Sharpe, R. (Eds.). (2013). *Rethinking pedagogy for a digital age: Designing for 21st century learning*. Abingdon, UK: Routledge.

Bergmann, J., & Sams, A. (2008). Remixing chemistry class. *Learning and Leading with Technology*, *36*(4), 24-27.

Biggs, J., & Tang, C. (2011). *Teaching for quality learning at university: What the student does*. UK: McGraw-Hill Education.

Bishop, J. L., & Verleger, M. A. (2013, June). The flipped classroom: A survey of the research. In *ASEE National Conference Proceedings*, Atlanta, GA.

Bonwell, C. C., & Eison, J. A. (1991). *Active learning: Creating excitement in the classroom* (ASHE–ERIC Higher Education Rep. No. 1). Washington, DC: The George Washington University, School of Education and Human Development.

Breen R., Lindsay R., Jenkins A. & Smith P. (2001). The role of information and communication technologies in a university learning environment. *Studies in Higher Education*, *26*, 95-114.

Candy, P. C. (1991). *Self-direction for lifelong learning: A comprehensive guide to theory and practice*. San Francisco: Jossey-Bass.

Chandler, N. (2013). Braced for turbulence: Understanding and managing resistance to change in the higher education sector. *Management*, *3*(5), 243-251.

Christensen, C. M., & Eyring, H. J. (2011). *The innovative university: Changing the DNA of higher education from the inside out*. Hoboken, NJ: John Wiley & Sons.

Christensen, C. M., Horn, Michael B, & Johnson, Curtis W. (2008). *Disrupting class: How disruptive innovation will change the way the world learns*. New York: McGraw-Hill.

Cochrane, T., Narayan, V. & Burcio-Martin, V. (2015). Designing a cMOOC for lecturer professional development in the 21st century. In J. Keengwe & G. Onchwari (Eds.), *Handbook of Research on Active Learning and the Flipped Classroom Model in the Digital Age*. 378-396. Hershey, PA: IGI Global.

Conole, G., De Laat, M., Dillon, T., & Darby, J. (2008). 'Disruptive technologies', 'pedagogical innovation': What's new? Findings from an in-depth study of students' use and perception of technology. *Computers & Education, 50*(2), 511-524.

Conway, P. F., & Clark, C. M. (2003). The journey inward and outward: a re-examination of Fuller's concerns-based model of teacher development. *Teaching and Teacher Education, 19*(5), 465-482.

Cross, S. (2013). *Evaluation of the OLDS MOOC curriculum design course: participant perspectives, expectations and experiences*. OLDS MOOC Project, Milton Keynes. Available online at: http://oro.open.ac.uk/37836/

Daradoumis, T., Bassi, R., Xhafa, F., & Caballé, S. (2013, October). A review on massive e-learning (MOOC) design, delivery and assessment. In *P2P, Parallel, Grid, Cloud and Internet Computing (3PGCIC), 2013 Eighth International Conference on IEEE* (pp. 208-213).

Deneen, C., & Boud, D. (2014). Patterns of resistance in managing assessment change. *Assessment & Evaluation in Higher Education, 39*(5), 577-591.

Ferren, A. S., Dolinsky, R., & McCambly, H. (2014). Collaborative, faculty-led efforts for sustainable change. *Peer Review*, *16*(4/1), 30-32.

Fink, L. D. (2003). *A self-directed guide to designing courses for significant learning*. University of Oklahoma, 1-35. Available online at: http://www.bu.edu/sph/files/2011/06/selfdirected1.pdf

Fink, L. D. (2013). *Creating significant learning experiences: An integrated approach to designing college courses*. Hoboken, NJ: John Wiley & Sons.

Freeman, S., Eddy, S. L., McDonough, M., Smith, M. K., Okoroafor, N., Jordt, H., & Wenderoth, M. P. (2014). Active learning increases student performance in science, engineering, and mathematics. *Proceedings of the National Academy of Sciences, 111*(23), 8410-8415.

Gaff, J. G. (2007). What if the faculty really do assume responsibility for the educational program? In David Tritelli (Ed.), *Liberal Education: Faculty Leadership and Institutional Change, 93*(4), 6-13.

Haggard, S., Brown, S., Mills, R., Tait, A., Warburton, S., Lawton, W., & Angulo, T. (2013). The maturing of the MOOC: Literature review of massive open online courses and other forms of online distance learning. *Department for Business, Innovation and Skills, UK Government*.

Hall, G. E. (1979). The concerns-based approach to facilitating change. *Educational Horizons*, 202-208.

Hall, G. E., & Hord, S. M. (2015). *Implementing change: Patterns, principles and potholes (4th ed.)*. Upper Saddle River, NJ: Pearson.

Hall, G. E., & Loucks, S. (1978). Teacher concerns as a basis for facilitating and personalizing staff development. *Teachers College Record, 80*(1), 46-58

Harde, N. (2013). The end of the university as we know it. Available online at: http://www.utoledo.edu/graduate/files/The%20End%20of%20the%20University%20As%20We%20Know%20It.pdf.
Ho, A. S. (2000). A conceptual change approach to staff development: A model for programme design. *International Journal for Academic Development*, *5*(1), 30-41.
Hodges, J. & Nelson, B. (2011). You want me to change to what? An ongoing study of faculty members' different stages of concern with change and the implications for change implementation in higher education. In C. Ho & M. Lin (Eds.), *Proceedings of E-Learn: World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education 2011* (pp. 1299-1301). Chesapeake, VA: Association for the Advancement of Computing in Education (AACE).
Hord, S. M. (1987). *Taking charge of change*. Alexandria, VA: ASCD.
Horsley, D. L., & Loucks-Horsley, S. (1998). CBAM brings order to the tornado of change. *Journal of Staff Development*, *19*(4), 17-20.
Hwang, G. J., Lai, C. L., & Wang, S. Y. (2015). Seamless flipped learning: a mobile technology-enhanced flipped classroom with effective learning strategies. *Journal of Computers in Education*, *2*(4), 449-473.
Hyman, P. (2012). In the year of disruptive education. *Communications of the ACM*, *55*(12), 20-22.
Johnson, L., Adams, S., Estrada, V., Freeman, A. (2014). *NMC Horizon Report: 2014 Higher Education Edition*. Austin, TX: The New Media Consortium.
Kolb, D. A. (2014). *Experiential learning: Experience as the source of learning and development*. Upper Saddle River, NJ: Pearson Education.
Kolowich, S. (2013). The MOOC 'revolution' may not be as disruptive as some had imagined. *The Chronicle of Higher Education*, *8*.
Kezar, A. (2012). Bottom-up/top-down leadership: Contradiction or hidden phenomenon. *The Journal of Higher Education*, *83*(5), 725-760.
Kelly, A. P. (2014). *Disruptor, distracter, or what?: A policymaker's guide to massive open online courses (MOOCs).* Boston, MA: Bellwether Education Partners. Available online at: http://www.voced.edu.au/content/ngv65930
Kim, P. (Ed.). (2014). *Massive open online courses: The MOOC revolution*. Abingdon, UK: Routledge.
Kolb, D. A. (2014). *Experiential learning: Experience as the source of learning and development*. FT Press.
Kolowich, S. (2013). The MOOC 'revolution' may not be as disruptive as some had imagined. *The Chronicle of Higher Education*, *8*.
Laurillard, D. (2013). *Teaching as a design science: Building pedagogical patterns for learning and technology*. Abingdon, UK: Routledge.

Leckart, S. (2012). The Stanford education experiment. *Wired, 20*(4), 68-77.
Liyanagunawardena, T. R., Adams, A. A., & Williams, S. A. (2013). MOOCs: A systematic study of the published literature 2008-2012. *The International Review of Research in Open and Distributed Learning*, *14*(3), 202-227.
Lucas, A. F. (2000). *Leading academic change: Essential roles for department chairs. The Jossey-Bass Higher and Adult Education Series*, San Francisco, CA: Jossey-Bass Publishers.
Marcu, A. D. (2013). *Relationship of self-efficacy to stages of concern in the adoption of innovation in higher education* (Order No. 3585793). Available from ProQuest Dissertations & Theses Global. (1513239008). Retrieved from http://search.proquest.com/docview/1513239008?accountid=14677
McGrath, A., Mackey, J. & Davis, N. (2008). Designing for authentic relationships, content and assessment in unpredictable learning contexts. In *Hello! Where are you in the landscape of educational technology? Proceedings ascilite Melbourne 2008*. Retrieved from: http://www.ascilite.org.au/conferences/melbourne08/procs/mcgrath.pdf
Merriam, S. B., Caffarella, R. S., & Baumgartner, L. M. (2012). *Learning in adulthood: A comprehensive guide*. Hoboken, NJ: John Wiley & Sons.
Mishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for integrating technology in teachers' knowledge. *Teachers College Record, 108*(6), 1017-1054.
Moore, J. C. (2005). A synthesis of Sloan-C effective practices. *Journal of Asynchronous Learning Networks*, *9*(3), 5-73.
Moore, A. H., Fowler, S. B., & Watson, C. E. (2007). Active learning and technology: Designing change for faculty, students, and institutions. *Educause Review, 42*(5), 42.
Roehl, A., Reddy, S. L., & Shannon, G. J. (2013). The flipped classroom: An opportunity to engage millennial students through active learning strategies. *Journal of Family & Consumer Sciences, 105*(2), 44-49.
Shank, J. D. (2013). *Interactive open educational resources: A guide to finding, choosing, and using what's out there to transform college teaching*. Hoboken, NJ: John Wiley & Sons.
Siemens, G. (2013). Massive open online courses: Innovation in education. *En: Open Educational Resources: Innovation, Research and Practice.* (RoryMcGreal, Ed.)(1st ed., p. 268). Athabasca: UNESCO. Retrieved from: http://www.col.org/resources/publications/Pages/detail.aspx.
Silberman, M. L. (Ed.). (2007). *The handbook of experiential learning*. Hoboken, NJ: John Wiley & Sons.
Taneja, S., & Goel, A. (2014). MOOC Providers and their strategies. *International Journal of Computer Science and Mobile Computing, 3*(5), 222-228.

W. K. Kellogg Foundation (2001). *Logic model development guide: Using logic models to bring together planning, evaluation, & action.* Battle Creek, MI: W.K. Kellogg Foundation. Available online at: https://www.wkkf.org/resource-directory/resource/2006/02/wk-kellogg-foundation-logic-model-development-guide

Wenger, E., McDermott, R. A., & Snyder, W. (2002). *Cultivating communities of practice: A guide to managing knowledge.* Boston, MA: Harvard Business Press.

Wiggins, G. P., & McTighe, J. (2005). *Understanding by design.* Alexandria, VA: ASCD.

Wilson, S., Liber, O., Johnson, M. W., Beauvoir, P., Sharples, P., & Milligan, C. D. (2007). Personal learning environments: Challenging the dominant design of educational systems. *Journal of e-Learning and Knowledge Society, 3*(2), 27-38.

Ziegenfuss, D. H. (2005). By instructional design: Facilitating effective teaching and learning with technology. In M. O. Thirunarayanan and A. Perez-Prado (Eds.), *Integrating Technology in Higher Education* (pp.19-45). Lanham, Md.: University Press of America.

WHO IS A STUDENT: COMPLETION IN COURSERA COURSES AT DUKE UNIVERSITY

Molly Goldwasser, Chris Mankoff, Kim Manturuk,

Lorrie Schmid, and Keith E. Whitfield

Duke University

ABSTRACT

Much of the interest in MOOCs centers on questions about who completes them. Duke's Coursera-based Massive Open Online Courses (MOOCs) confirm many demographic trends previously delineated by researchers at peer institutions. As found in previous research, this study found individuals who speak English as a first language and who already earned at least a bachelor's degree are the most likely to complete a Coursera course. MOOC researchers to date have not, however, developed clear operational definitions about who constitutes a learner at the outset of the course. This paper proposes some possible definitions to standardize future research. Further, this study looked at factors that predict different learner participation levels and investigated which activities predict Coursera course completion. Study results indicated that viewing online forums and participation in online discussions are both predictive of course completion. The findings suggest that the socio-demographic composition of the group being investigated will depend on how researchers elect to define what a "student" is. Thus, while any of the definitions presented in this paper may be appropriate, depending on what is being studied, the decision of which definition to use should be intentional.

KEYWORDS: Massive Open Online Courses (MOOCs), Coursera, Completion, Enrollment, Duke University

WHO IS A STUDENT: COMPLETION IN COURSERA COURSES AT DUKE UNIVERSITY

Molly Goldwasser[xvi], Chris Mankoff[xvii], Kim Manturuk[xviii],

Lorrie Schmid[xix], and Keith E. Whitfield[xx]

Duke University

Acknowledgments: Thank you to Dr. Carol Ripple, Associate Director for Education Research and Engagement, and Dr. Lynne O'Brien, Associate Vice Provost for Digital and Online Initiatives for their support of this study.

INTRODUCTION

Who is a student? In traditional higher education classes, that question is easily answered: Students are people who enroll in a class; if they drop out, they are no longer considered students in the class. However, how do researchers and instructors define who is a student in a massive, open, online class (MOOC)? Unlike students in a traditional college class, students in a MOOC face no consequence for ceasing to participate in a MOOC and have no real incentive to formally withdraw. Similarly, because there is no cost to participate, many people register for a MOOC with no intention of participating throughout the entire course. In this paper, we explore the problem of defining the role of student in a MOOC.

BACKGROUND

MOOCs have received much publicity in recent years and have become a topic of great interest to researchers. MOOCs are free or very low-cost online courses that typically include instructional videos, assessments, and communication forums; however, new variations on the activities continue to emerge (Beaven, Hauck, Comas-Quinn, Lewis, & de los Arcos, 2014; Fox, 2014). Early research on MOOCs has largely focused on understanding the demographic profile of people who enrolled in courses. For example, an early study looked at data from MIT's first MOOC and found that the people who enrolled were predominately in their 20s and 30s, already had a college degree, and had prior experience in the course topic (Breslow, Pritchard, DeBoer, Stump, Ho, & Seaton, 2013; Emanuel, 2013). Research on other courses and institutions has found similar results (e.g., Christensen, Steinmetz, Alcorn, Bennett, Woods, & Emanuel, 2013; Jordan, 2014).

However, while these studies have documented who enrolls in MOOCs, we believe that there is another question that merits scholarly attention: How do we define the "student" role? There is strong evidence that many people who register for a MOOC have no intention of completing all or any of the activities in

the course (Reich, 2014; Wang & Baker, 2015). Because enrollment has been free, there is no consequence to registering and not participating. Therefore, if researchers use the entire population who register as the basis for their research on course completion, their results are likely to be biased in that it is irrelevant to ask why someone did not finish a course if that person never intended to do so.

We believe the question of who researchers identify as a student is important because much of the discussion around MOOCs has centered on course completion rates. A key criticism of MOOC participation has been the low completion rate among learners (Kolwich, 2013; Yang, Sinha, Adamson, & Rose, 2013). With enrollments well over 10,000 in most courses, completion rates, when calculated as percentages of the original enrollment, are quite low (Catropa, 2013; Jordan, 2014). Kolowich (2013) suggested the overall completion rate of MOOCs hovers around 10%. More recent data suggest that, on average across any MOOC, about 43,000 learners enroll and about 6% complete (Jordan, 2014). However, early MOOC researchers assumed all who registered for a course were students with the potential to complete the course. As one researcher has pointed out, early MOOC learning attracted many people who were "merely curious and tourists from other institutions checking what the fuss was about" (Daniel, 2012).

SIGNIFICANCE

The concept of providing free college-level courses to the public is not new. As early as the late 1950s, New York University offered two college courses per semester via television through their Sunrise Semester program (Riddle, 2013). Much like MOOCs today, the televised courses enabled students to watch the content for free or to pay a small fee for credit. However, in spite of this history, research on MOOCs is in its infancy and has generally not drawn from prior similar projects. In their review of the published literature between 2008 and 2012, the authors identified only 45 peer-reviewed articles about MOOCs (Liyanagunawardena, Adams, & Williams, 2013). The present analysis represents a significant contribution to this small, yet growing, body of work for three reasons.

First, most prior studies using data from MOOCs have relied on data collected from a single course (e.g., Bell, 2010; Kizilcec, Piech, and Schneider, 2013) One notable exception is a study by Ho et al. (2015), whose research used data aggregated from 18 courses offered by Duke University between 2012 and 2014. This course sample size largely reduced the risk that findings would be biased by unique enrollment patterns in a single course. Second, this paper examines a topic that, to our knowledge, has not been explored in prior research. Many published studies have documented demographic patterns in MOOC enrollment (e.g., Christensen et al., 2013), and researchers have also analyzed the activities people undertake in MOOCs and how those activities relate to course completion (Ho et al., 2015). However, in both of these types of research, the

authors have taken as their total student population the number of people who registered or enrolled in the course. We question this assumption and explore the possible impact of the definition of "student" on research conclusion.

Finally, we relate our analysis to the current debate about the future of MOOCs. Some leaders in the open education movement have been critical of MOOCs because of the low completion rates reported by researchers and universities (Clow, 2013). We contend that this criticism should be reevaluated. Dropout rates in MOOCs are not as high as suggested in prior reports when one controls for intent to complete the course and defines a student as one who is participating in course activity after a pre-determined grace period. Even researchers who do not exclude such people from their counts of students in a MOOC will benefit from some insight regarding how that decision impacts their analyses.

WHO IS A STUDENT?

MOOC enrollment and persistence statistics consistently classify *completers* as those who have earned some form of a certificate of achievement (in Coursera, these include a Statement of Accomplishment or a Verified Certificate) from the MOOC provider. However, there is no consensus about who constitutes a student at the beginning of the course (DeBoer et al, 2014). Is a student someone who:

- Enrolls in the course?
- Visits the course website?
- Watches a course video?
- Completes an assignment?
- Participates in a discussion forum?
- Some combination of more than one of the criteria listed above?

Traditional education typically waits until the end of a grace period (e.g., drop/add period) to count enrollment and to determine baseline student statistics. If MOOC researchers were to do the same, course completion statistics would increase. However, there is no clear drop point in a MOOC. Some researchers have predicted which students will drop out of a course based on patterns of activity (Halawa, Greene, & Mitchell, 2014) and forum posts (Chaplot, Rhim, & Kim, 2015). These studies focused on predicting dropouts from enrolled and active students. We build on this previous work by assessing who the students are based on the course activities in which they participate. Different demographic groups appear to participate in different course activities; therefore, defining students based on these different participation rates can lead to different research conclusions regarding rates of course completion. In addition, useful information about when and how individuals use course elements, regardless of whether they ultimately complete the course, can inform understandings regarding learner engagement with the material (Kizilcec et al., 2013).

DATA AND METHODS

In this paper, we present different ways to define a student based on course activities. This includes defining a student as someone who: 1) enrolled in the course, 2) ever visited the course website, 3) watched any video lecture, 4) viewed the discussion forum, or 5) submitted any graded assignment. For each of the five possible definitions, we present regression models that indicate the likelihood of various demographic measures correlating with someone fitting the definition of a student. For example, we find that older course enrollees were more likely to watch any video lecture than younger enrollees. We discuss the implications of these findings for research; how researchers elect to define "students" will impact the socio-demographic composition of the group being investigated. Finally, we present our recommendation that researchers define students as enrollees who attempt at least one graded assessment. We conclude by explaining this recommendation and presenting the next steps for research in this area.

These analyses included all enrolled learners in 18 unique course session offerings comprising 58% of the MOOC offerings at Duke between 2012 and 2014. All courses with complete data were included.[1] See Table 1 for enrollment and activity behaviors (i.e., watching a video, writing a forum post, and receiving a certificate) for each course.

Course Name / Session	Enrolled	Watched video	Wrote a forum post	Completed assignment	Received SOA or VC
Bioelectricity / 1	18,263	7,757	814	3,727	314
Bioelectricity / 2	9,795	3,956	362	9,795	210
Think Again / 1	226,767	119,936	9,358	82,543	5,332
Astronomy / 2	53,640	27,097	1,856	7,670	867
Human Physiology / 1	82,437	32,583	2,185	6,665	1,036
Human Physiology / 2	46,004	N./A	1,317	3,699	871
English Composition / 1	82,943	36,828	11,649	3,505	1,289
Med Neuroscience / 1	66,235	21,368	2,277	12,461	590
Med Neuroscience / 2	41,985	17,668	1,184	9,855	519
Health Innovation / 1	43,445	11,305	2,396	4,410	3,057
Sports & Society / 1	19,394	6,073	1,092	3,402	1,629
Sports & Society / 2	11,074	4,188	655	1,864	1,084
9/11 & Aftermath / 1	16,783	6,191	911	2,648	464
Amer Foreign Policy / 1	23,720	7,850	846	3,490	1,760
Intro to Chemistry / 1	34,632	14,872	1,687	8,320	556
Higher Education / 1	18,809	7,247	1,311	3,679	1,532
Marine Megafauna / 1	14,374	6,989	1,305	4,232	1,469
Data Analysis / 1	86,417	33,483	3,181	65,696	2,516
Total	896,717	365,391	44,386	237,661	25,556

Table 1: Duke Coursera Activities by Course

[1] The 42% of courses that were excluded from analysis were omitted due to problems in the source data files, as discussed in the Limitations and Conclusion section of this work

We collected data in two ways: through the Coursera platform and through the use of a pre- and post- survey designed by the Center for Instructional Technology (CIT) at Duke. Demographic indicators used in the analyses include: age, gender, educational level, English as a primary language, race, ethnicity, nationality, and employment status. These were selected because prior research has indicated that these variables correlated with enrollment in and completion of MOOCs (Christensen, 2013; Katy, 2014; Kizilec et al., 2013). We also assessed student activity behaviors, including whether students visited the course website, watched a video, viewed the forum, wrote a forum post, completed a graded assessment, and completed the course. The composite results across all 18 classes on student activities are shown in Table 2.

Activity	N	%
Visited course website	580,664	64.75
Watched a video	365,391	40.75
Viewed a forum	94,232	10.51
Wrote a forum post	44,386	4.95
Completed at least one graded	192,682	21.49
Received certification	25,556	2.44

Table 2: Composite Student Activity Behaviors

Approximately 900,000 learners enrolled in these 18 course session offerings. Fifty-five percent of the learners identified as male, and 45% identified as female. The sample included learners from all over the world and many nationalities. Sixty-three percent identified as White, 22% as Asian, 4% as Black, and 8% as some other category. Sixty-two percent of the sample was aged 34 and younger. Across the whole sample, 35% had completed a bachelor's degree and an additional 30% had advanced degrees. Forty-eight percent reported working full time.

In order to understand how decisions about defining the student body in a MOOC affect subsequent analyses, we began by conducting logistic regression analyses to examine which demographic measures were associated with different criteria for defining students. For example, if we define "students" as those people who ever visited the course website (as opposed to all people who registered), and our models indicate that race is a significant predictor of visiting a course website, then our decision regarding how to define a student will have empirical implications. In the second stage of our analysis, we take course completion as the dependent variable and use both demographic measures and course activity behavior to predict course completion. By comparing which demographic measures were significant in each model, we present a clear example of how research conclusions are affected by how researchers define the student body.

RESULTS

Tables 3 and 4 present the regression results predicting different categories of student activities. Table 3 presents the results predicting whether someone who enrolled in the course ever visited the course website, ever watched an instructional video, or had ever viewed the discussion forum. People who visited the website, as compared to people who enrolled but never went to the website, were more likely to be male, speak English as their first language, and be aged 35 or older. Learners who participated in watching a video were more likely to identify as Latino or Hispanic and also more likely to be age 35 or older. Those who ever viewed a forum post were more likely to be male, speak English as their first language, and be aged 35 or older. They were also less likely to identify as black or as having already completed college.

	Visits course website		Watches a video		Views the forum posts	
	β	*SE*	*β*	*SE*	*β*	*SE*
Intercept	1.65 ***	0.18	0.42 ***	0.09	-0.77 ***	0.09
Male	0.39 ***	0.09	0.05	0.04	0.19 ***	0.04
African American	0.37	0.25	-0.09	0.11	-0.32 **	0.11
Asian	0.23	0.23	-0.06	0.10	-0.17	0.10
Other Races	0.69 *	0.28	0.18	0.11	-0.13	0.10
Hispanic / Latino	-0.12	0.12	0.16 **	0.06	-0.04	0.05
English 1st language	0.50 ***	0.09	0.06	0.05	0.12 **	0.04
High School or Less	0.14	0.20	0.01	0.09	-0.19 *	0.09
Some College	-0.04	0.13	-0.07	0.07	-0.15 *	0.06
More than a BA/BS	-0.02	0.10	-0.02	0.05	0.02	0.04
Age – 17 or less	-0.22	0.29	-0.02	0.05	0.09	0.15
Age – 26-34	0.10	0.12	0.18 **	0.06	-0.01	0.06
Age – 35-44	0.37 **	0.14	0.38 ***	0.07	0.33 ***	0.06
Age – 45-54	0.70 ***	0.16	0.68 ***	0.08	0.46 ***	0.07
Age – 55-64	1.15 ***	0.20	0.72 ***	0.09	0.67 ***	0.08
Age – 65 and over	1.09 ***	0.25	0.87 ***	0.11	0.73 ***	0.09
N	11295		11295		11295	
Pseudo R^2	0.0102		0.0170		0.0238	

Note: White, female, BA/BS and 18-25 are the reference groups.
*Sig p-values are: *<.05, **<.01, ***<.001*

Table 3: Regression Models Predicting Passive Course Activity Participation

Table 4 describes findings from our examination of student activity patterns that involve more commitment or effort to complete: writing a forum post, completing an assignment, and/or receiving a certificate. Learners who wrote at least one discussion forum post were more likely to be female and were less likely to have an advanced degree. Given the results of the other models, it is not surprising that people whose first language was English and relatively older learners were more likely to post in the discussion forum.

In an alternate model, we looked at people who completed a course assignment; we found that men, native English speakers, and those older than 35 years old were more likely to complete an assignment. Consistent with other studies, we found that course completion correlated with being a native English speaker, with already having a college degree, and with being aged 35 and older (Christensen et al, 2013).

	Wrote a forum post		Completed an assignment		Received certificate	
	β	*SE*	*β*	*SE*	*β*	*SE*
Intercept	-1.66 ***	0.10	0.28 *	0.11	-2.34 ***	0.12
Male	-0.24 ***	0.04	0.13 **	0.05	0.08	0.05
African American	0.13	0.12	-0.15	0.13	-0.29	0.15
Asian	0.08	0.11	-0.06	0.13	0.01	0.13
Other Races	0.13	0.11	-0.03	0.13	-0.43 ***	0.15
Hispanic / Latino	0.03	0.06	0.01	0.07	-0.10	0.07
English 1st language	0.19 **	0.05	0.26 ***	0.05	0.22 **	0.06
High School or Less	-0.02	0.10	-0.18	0.11	-0.29 *	0.14
Some College	0.04	0.07	-0.12	0.08	-0.16	0.09
More than a BA/BS	-0.16 **	0.05	-0.06	0.06	0.20 **	0.06
Age – 17 or less	0.19	0.18	0.12	0.19	0.33	0.23
Age – 26-34	0.26 **	0.07	0.03	0.08	0.11	0.09
Age – 35-44	0.41 ***	0.07	0.08	0.08	0.38 ***	0.09
Age – 45-54	0.64 ***	0.08	0.30 **	0.09	0.46 ***	0.09
Age – 55-64	0.62 ***	0.09	0.29 **	0.10	0.46 ***	0.10
Age – 65 and over	0.47 ***	0.11	-0.05	0.11	0.10	0.13
N	11295		7929		11295	
Pseudo R^2	0.0104		0.0076		0.0100	

Note: White, female, BA/BS and 18-25 are the reference groups.
*Sig p-values are: *<.05, **<.01, ***<.001*

Table 4: Regression Models Predicting Active Course Activity Participation

These findings highlight the need to make intentional and research-driven decisions about defining a student in a MOOC. Depending on the criteria used to define a student, we may find, for example, that students in a course are more likely to be male or to have an advanced degree. We continued to illustrate this point in the second set of analyses by conducting two sets of logistic regressions predicting course completion, focusing on participation in the forums. In one case we defined as students the participants who had viewed discussion posts (yielding findings represented in Table 5). In another case we defined as students those who posted on a forum site (yielding findings represented in Table 6). Two models were conducted for each regression. Model 1 includes only the forum indicator of interest, and Model 2 includes the indicator as well as demographic variables.

As seen by comparing the two analyses, the model including the variable for viewing the forum generates a significant negative coefficient for the Hispanic/Latino variable. However, the same measure is not significant in the model including the variable indicating someone had posted in the forum. This illustrates how research decisions regarding what course activities qualify someone as a student affect the results of an analysis of course completion.

	Model 1		Model 2	
	β	*SE*	*β*	*SE*
Intercept	-4.75 ***	0.01	-3.20 ***	0.06
Viewed Forum	2.98 ***	0.02	2.20 ***	0.03
Male			-0.33 ***	0.03
African-American			-0.77 ***	0.17
Asian			-0.29 ***	0.08
Other races			-0.90 ***	0.03
Hispanic/Latino			-0.18 **	0.07
English 1st language			-0.45 ***	0.03
Age			0.13 ***	0.01
N	896,717		110,206	
Pseudo R^2	0.20		0.15	

Note: White and female are the reference groups.
*Sig p-values are: *<.05, **<.01, ***<.001*

Table 5: Predicting Course Completion from Viewing the Forum Postings

	Model 1		Model 2	
	β	*SE*	*β*	*SE*
Intercept	-4.29 ***	0.02	-3.00 ***	0.06
Posted in forum	2.95 ***	0.01	1.89 ***	0.03
Male			-0.52 ***	0.03
African-American			-0.97 ***	0.17
Asian			-0.34 ***	0.08
Other Races			-0.94 ***	0.03
Hispanic / Latino			-0.10	0.07
English 1st language			-0.08 **	0.03
Age			0.11 ***	0.01
N	896,717		110,206	
Pseudo R^2	0.15		0.13	

Note: White and female are the reference groups.
*Sig p-values are: *<.05, **<.01, ***<.001*

Table 6: Predicting Course Completion from Writing Forum Postings

DISCUSSION AND NEXT STEPS

The findings of the current study highlight the importance of defining who is a student when looking at patterns of participation and completion in MOOCs. Important in these findings is that education, age, and gender matter in distinctive ways depending on how one defines the population of interest. Our results suggest that older learners, while a smaller proportion of the overall population of MOOC learners, are more likely to watch a video but less likely to complete the course than younger participants. These differences may indicate that learners of different ages may have different intentions when registering for a MOOC. It may also reflect generational differences in the way learners consume information. It may be that younger adults are used to searching for bits of information from multiple sources and use multiple resources to obtain knowledge. Older adults on the other hand may be using traditional approaches to knowledge acquisition.

Also interesting were the gender-based findings. While more men enrolled than women, women were more likely to engage with the course by writing a forum post. There has been much discussion of gender differences in the style and content of computer- mediated communication (e.g., Herring, 2000). Many instructors of MOOCs are interested in the utility of the forums for discussing course material and creating community among geographically diverse course participants. Our results indicate that, while most learners do not

participate in the discussion forums, those who do are more likely to complete the course.

Demographic variables in this study were defined by traditional U.S. American classifications. Additional research is needed to examine student trends by sub-category according to different global norms. There is also a need for content analyses of the posts to see if there are gender differences. Future research is also needed to investigate how lessons learned from MOOCs impact traditional students on campus.

LIMITATIONS AND CONCLUSION

The data used for this research have some limitations. Almost half of the data files we obtained had errors that made them unusable in this analysis. These tended to be the data files generated in courses run relatively early in the history of use of the MOOC platform, so our analyses may not be as applicable to MOOCs offered early in the project. The most serious limitation in this study, and one that often affects research on MOOCs, involves selection bias. The large numbers of people who enrolled yet never participated in any course activities were also people who were less likely to complete the demographic survey or the pre- and post- surveys. In future research, we hope to use analytic techniques to account at least partially for selection bias; however, that was not possible with this project. We therefore offer the caveat that the analysis presented here should be taken as illustrative of the need to make theoretically-based decisions about defining who a student is, while acknowledging that the empirical findings related to predicting course activities may not generalize to other courses.

In conclusion, we recommend that researchers define a student based on the research question under investigation. When looking at completion rates, as many recent studies have done, it logically follows to consider a student to be anyone who has attempted at least one assessment. These are the people enrolled in the course who are most likely to intend to complete the course. This definition excludes people who enrolled simply to watch videos or explore the course structure. Alternatively, if researchers are interested in analyzing patterns of movement in a course—the order in which people move through materials—it logically follows that they would want to include all participants who ever visited the course website. Any of the definitions of who is a student presented in this paper may be appropriate depending on what is being studied, but the decision of which definition to use should be one made intentionally and not by default, as has often been done to date.

REFERENCES

Beaven, T., Hauck, M., Comas-Quinn, A., Lewis, T., & de los Arcos, B. (2014). MOOCs: Striking the right balance between facilitation and self-determination. *MERLOT Journal of Online Learning and Teaching, 10,* 31-43.

Bell, F. (2011). Connectivism: Its place in theory-informed research and innovation in technology-enabled learning. *The International Review of Research in Open and Distance Learning, 12*(3): 98-118.

Breslow, L., Pritchard, D., DeBoer, J., Stump, G., Ho, A., & Seaton, D. (2013). Studying learning in the worldwide classroom: Research into edX's first MOOC", *Research and Practice in Assessment, 8*, 13-25.

Catropa, D. (2013). Big (MOOC) data. *Inside Higher Ed*. Retrieved from https://www.insidehighered.com/blogs/stratedgy/big-mooc-data.

Chaplot, D. S., Rhim, E., & Kim, J. (2015). Predicting student attrition in MOOCs using sentiment analysis and neural networks. In *AIED 2015 Workshop Proceedings – Vol 3*. Retrieved from http://ceur-ws.org/Vol-1432/islg_pap2.pdf

Christensen, G., Steinmetz, A., Alcorn, B., Bennett, A., Woods, D., & Emanuel, E. J. (2013). The MOOC phenomenon: Who takes massive open online courses and why? Retrieved from http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2350964

Clow, D. (2013). MOOCs and the funnel of participation. *In Third International Conference on Learning Analytics and Knowledge (LAK 2013)*. Leuven, Belgium. doi: 10.1145/2460296.2460332_.

Daniel, J. (2012). Making sense of MOOCs: Musings in a maze of myth, paradox, and possibility. *Journal of Interactive Media in Education.*

DeBoer, J., Ho, A. D., Stump, G. S., & Breslow, L. (2014). Changing "course" Reconceptualizing educational variables for massive open online courses. *Educational Researcher, 43,* 74-84. doi: 0013189X14523038.

Emanuel, E. (2013). Online education: MOOCs taken by educated few. *Nature*, 503 (7476), 342. doi: 10.1038/503342

Fox, A. (2014). From MOOCs to SPOCs. *Communications of the ACM, 56* (12), 38-40. doi: 10.1145/2355.918

Halawa, S., Greene, D., & Mitchell, J. (2014). Dropout prediction in MOOCs using learner activity features. *Proceedings of the European MOOC Summit.* Lausanne, Switzerland.

Herring, S.C. (2000). Gender differences in CMC: Findings and implications. *Computer professionals for social responsibility newsletter, 18*(1). Retrieved from http://cpsr.org/issues/womenintech/herring/.

Ho, A. D., Chuang, I., Reich, J., Coleman, C. A.,Whitehill, J., Northcutt, C. G., Williams, J. J., et al. (2015). HarvardX and MITx: Two years of open online courses Fall 2012 – Summer 2014. Retrieved from http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2586847.

Jordan, Katy. (2014). Initial trends in enrollment and completion of massive open online courses. *The International Review of Research in Open and Distributed Learning, 15*(1).

Kizilcec, R. F., Piech, C., & Schneider, E. (2013). Deconstructing disengagement: Analyzing learner subpopulations in massive open online courses. In D. Suthers, K. Verbert, E. Duval, & X. Ochoa (eds.), *Proceedings of the 3rd International Conference on Learning Analytics and Knowledge* (pp. 170-179). Leuven: Solar

Kolowich, S. (2013). Coursera takes a nuanced view of MOOC dropout rates. *The Chronicle of Higher Education*. Retrieved from http://chronicle.com/blogs/wiredcampus/coursera-takes-a-nuanced-view-of-mooc-dropout-rates/43341

Liyanagunawardena, T. R., Adams, A. A., & Williams, S. A. MOOCs: A systematic study of the published literature, 2008-2012. *Review of Research in Open and Distance Learning, 14*(3), 202-227.

Riddle, Randy. (2013). MOOC Pre-History. *Inside Higher Ed*. Retrieved from https://www.insidehighered.com/blogs/technology-and-learning/mooc-pre-history.

Reich, J. (2014). MOOC completion and retention in the context of student intent. *Educause Review.* Retrieved from http://www.educause.edu/ero/article/mooc-completion-and-retention-context-student-intent

Seaton, D. T., Bergner, Y., Chuang, I., Mitros, P., & Pritchard, D. E. (2014). Who does what in a massive open online course? *Communications of the ACM, 57*(4), 58-65.

Wang, Y., & Baker, R. (2015). Content or platform: Why do students complete MOOCs? *MERLOT Journal of Online Learning and Teaching, 11*(1), 17-30.

Yang, D., Sinha, T., Adamson, D., & Rose, C. P. (2013). Turn on, tune in, drop out: Anticipating student dropouts in massive open online courses. In *Proceedings of the 2013 NIPS Data-Driven Education Workshop* (Vol. 11, p. 14).

APPLYING A COMMUNITY OF INQUIRY INSTRUMENT TO MEASURE STUDENT ENGAGEMENT IN LARGE ONLINE COURSES

Carol A.V. Damm
Brandeis University

ABSTRACT

The similarity of structure shared by Massive Online Open Courses (MOOCs) and traditional online college courses creates the opportunity to evaluate MOOC and related course offerings using a validated evaluation instrument, the Community of Inquiry (CoI) survey, to measure Teaching, Social, and Cognitive Presences (Garrison, Anderson, & Archer, 2000) in college-level online courses. In this study, the survey has been adapted to evaluate instances of student engagement in large online courses offered at low cost by a publishing firm. The courses suffer from two of the standard problems associated with MOOCs: high dropout rates and inconsistent participation among all but a small percentage of learners. In addition, the design of courses—the module structure, the assignments and activities—and the large class sizes are similar to those of MOOCs. Study participants were students of eight online courses offered consecutively by the publisher between January 2014 and May 2015. The study uses a mixed methodology based on the validated CoI survey to answer the following questions:

- Will low engagement rates in large online courses correlate with weak social presence, teaching presence, and/or cognitive presence as measured by this Community of Inquiry instrument?
- Can a student's engagement or non-engagement with a large online course be measured effectively with this CoI instrument?

The data reveal that students in these publisher-offered courses have positive perceptions of Teaching and Cognitive Presence. However, they have an ambivalent to negative perception of Social Presence.

KEYWORDS: MOOCs, Community of Inquiry, CoI, engagement, disengagement, teaching presence, social presence, cognitive presence, course completion, learning community

Garrison, D. R., Anderson, T., & Archer, W. (2000). Critical inquiry in a text-based environment: Computer conferencing in higher education. *The Internet and Higher Education, 2*, 87−105.

APPLYING A COMMUNITY OF INQUIRY INSTRUMENT TO MEASURE STUDENT ENGAGEMENT IN LARGE ONLINE COURSES

Carol A.V. Damm[xxi]
Brandeis University

INTRODUCTION

Massive open online instructor-led courses (MOOCs) have become part of the landscape of course offerings through public and private universities. They differ from online courses that may make up part of a degree program offered by a college or university. The most obvious difference is that, currently, a student who enrolls in a MOOC will not receive credit for a degree from the institution offering the course. Rather MOOC participants may receive a certificate of completion, either for free or for a fee substantially lower than traditional tuition rates. Most, if not all, courses offered on the various MOOC aggregators—such as, edX, Coursera, Iversity—are free unless a student wants to receive a certificate acknowledging successful completion of the course. Some MOOCs are bundled together to offer a certificate of mastery in a particular field or topic. Another difference between traditional online courses and MOOCs is that the open enrollment of courses can lead to large class sizes ranging from the hundreds to the tens of thousands. Moreover, many MOOCs allow a student to enroll past the start date of the course as well as to continue working on the course several weeks or months past the final week of the course.

In other ways, these courses are similar to credit-bearing online university courses. MOOCs are instructor-led or facilitator-led. They are presented on a learning management system (LMS). They offer students the opportunity to connect with each other and with the instructor or facilitator through a discussion board (DB). Some open courses require students to post work on the DB and to give feedback on their peers' work, as is common in college-level online courses. The intellectual material and assignments are presented on the LMS. Often, written assignments must be submitted through this platform, or tests must be taken and graded on the LMS. Ultimately, the LMS represents a virtual classroom. It is the space where learning happens and where this learning gets evaluated.

This similarity of structure shared by MOOCs and traditional online college courses creates the opportunity to evaluate MOOC and related course offerings using a validated evaluation instrument developed to measure Teaching, Social, and Cognitive Presences in college-level online courses. This instrument, the Community of Inquiry (CoI) survey, has been developed and used to

determine the efficacy of traditional online courses. In this study, the survey has been adapted to evaluate instances of the relatively new learning model represented by MOOCs. The research provided in this study focuses particularly on student engagement in a large online course by using a mixed methodology based on the validated Community of Inquiry (CoI) survey to answer the following questions:

- Will low engagement rates in large online courses correlate with weak social presence, teaching presence, and/or cognitive presence as measured by this Community of Inquiry instrument?
- Can a student's engagement or non-engagement with a large online course be measured effectively with this CoI instrument?

BACKGROUND

The advancement of technologies in the past decade has enabled this new industry of large online courses that offer video and audio streaming of pre-recorded lectures, e-books, discussion boards, automated grading of exams and written assignments, and open access. Pedagogical and andragogic approaches have had to evolve in order to harness the technology effectively to enable students to engage with and absorb material in this virtual environment. As Anderson and Dron explain, "a learning management system that sees the world in terms of courses and content will strongly encourage pedagogies that fit that model and constrain those that lack content and do not fit a content-driven course model" (2011).

In most MOOCs, the design of instruction is informed by cognitive-behaviorism, an approach that came out of the early twentieth century: "[Udacity, Coursera, edX] exhibit common defining characteristics that include: massive participation; online and open access; *lectures formatted as short videos combined with formative quizzes; automated assessment and/or peer and self-assessment* [italics added] and online fora for peer support and discussion" (Glance, Forsey, Riley, 2013, p. 2). Of necessity, this tried and true approach to content-based instruction creates both formal assessment and self-assessment that allow an instructor or an institution to determine if the learner has successfully mastered the topic.

These large online classes may also take a constructivist approach. Constructivism refers to the learning process wherein new knowledge is "constructed" and absorbed by the learner. According to constructivist theory, learners construct meaning through the process of integrating new knowledge with existing knowledge and/or experience. This approach assumes the importance of peer interaction for effective learning, such as the interaction that might occur on DBs or through group assignments. As instructional designers, educators, and researchers have assimilated this theory into curriculum design, they have modified it to account for the ever-growing complexities of relationships and networks in an increasingly connected world. The Community of Inquiry (CoI) model has evolved out of a constructivist view of online learning.

CoI advocates assert that certain elements are crucial for a successful online experience in higher education: social presence, teaching presence, and cognitive presence (Garrison, Anderson, & Archer, 2000). Social presence refers to the student-to-student relations and interactions or group dynamics. Teaching presence is the design and implementation of the curriculum as facilitated by the teacher. Cognitive presence refers to "the extent to which the participants in any particular configuration of a community of inquiry are able to construct meaning through sustained communication" (Garrison et al., p. 89). Figure 1 (directly below) diagrams these overlapping elements of a Community of Inquiry.

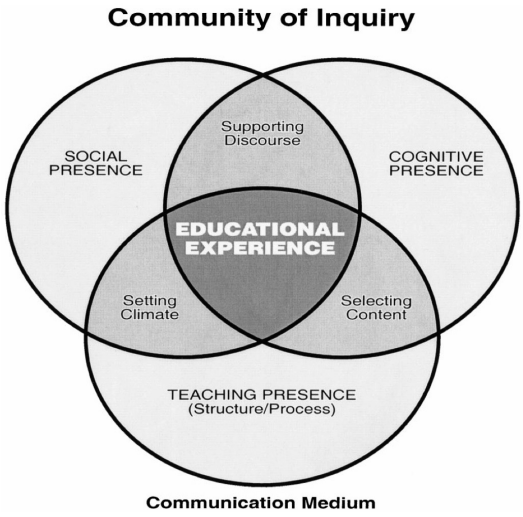


Fig. 1: Elements of an educational experience. (Garrison et al.)

This CoI model has informed the primary focus of research in the field, as described below. Using the CoI model as their framework, researchers Arbaugh et al. (2008) designed a survey that "has been extensively validated in a wide range of universities with very large samples in two countries" (Rubin, Fernandez, 2013, p. 118). The surveys were conducted over three years and included a large student population (875 students across 44 online courses with a response rate of 35.5%). The researchers were able to corroborate that all three presences existed in the majority of online courses examined in their study.

RESEARCH

A U.S. book publisher (BP) offers online courses with an average course participation of 400 students on a commercial learning management system. The courses are headlined by authors of popular books that this organization publishes, and courses are facilitated by staff and by the authors, the latter of whom are also educators or consultants in their fields. Courses are produced using a course design template developed by the staff at BP.

The courses suffer from two of the standard problems associated with Massive Online Open Courses (MOOCs): high dropout rates and inconsistent participation among all but a small percentage of learners. In addition, the design of BP courses—the module structure, the assignments and activities—and the large class sizes are similar to that of MOOCs. However, unlike MOOCs, which are usually free, BP's large online courses require the learner to pay for the course when registering; those who choose to earn continuing education credits pay an additional fee. The registration fee averages between $175 to $200 per course. Therefore, a student's commitment to a BP course could be associated with the commitment level exhibited by students in a tuition-bearing online course. Registration has been successful enough to justify expanding offerings. However, the publisher wants to increase participation and user engagement, if that is possible. They would like to encourage a vibrant community of learners. In the interest of better understanding how students engage with their courses, BP agreed to share data from previous and ongoing courses for the purposes of this research project.

One challenge of an online course is to keep students motivated and ensure their absorption of the material. The large number of students who register for Massive Online Open Courses (MOOCs) but do not complete them, and/or do not stay engaged throughout, has been a principal component of the criticism of the efficacy of this course genre for making quality education available to all. The average dropout rate—disengagement—of students of MOOCs is 85% (Hobson and Young, 2015). Even when students of MOOCs pay for certification or pay to take a course, the percentage of students who drop out is higher than one would expect among a group whose members have committed financially to receive acknowledgment of successful completion of a course. As Anant Agarwal, CEO of edX explains, among those who pay to receive certification for completion of a MOOC, on average only 60% successfully complete the course (Hobson, et al., 2015).

Since the large online courses offered by the publisher also have a high rate of disengagement, despite the fact that students pay for the course and certification, analysis of data from these courses provides the opportunity to measure students' engagement with this model of education, a situation which has allowed me to investigate whether or not aspects of these courses affect students' disengagement.

The investigation entailed a case study of courses offered by the publisher. The study used mixed methodologies. The course design and implementation were analyzed through the Community of Inquiry (CoI) model that asserts the following elements to be crucial for a successful online experience in higher education: social presence, teaching presence, and cognitive presence (Garrison, Anderson, & Archer, 2000).

ANALYSIS OF CONTEXT

PARTICIPANTS

Study participants were students of eight online courses offered consecutively by the publisher between January 2014 and May 2015. BP advertised the courses on its website, in its e-newsletter, in several publications that had been identified to reach the target audience, and in online publications and websites that were frequented by the same target audience. The ages of members of this audience ranged from early 20s to 60s and older. No demographics were polled for this study.

COURSE STRUCTURE

The courses consisted of six to eight modules that had to be taken consecutively in order to advance through the course. The courses were available for six months, but enrollment closed one month after the course began. All of the courses were presented on a commercial learning management system (LMS) designed to reflect the publisher's aesthetics. (The courses will not be referred to by name in this study in order to retain the publisher's anonymity. They have been coded as BPC-#. The numbers run consecutively by date from the first to the last course included herein.)

The structure of each course required the student to complete a quiz or reflection before the next module was unlocked and made accessible to the student. All other activities were voluntary. Assignments in some courses included a guided practice or contemplation relevant to the topic with a recommended activity such as journal writing, meditation, or reflection practice. Each module began with a BP-produced video of the author speaking to the camera or to an audience. Additional videos from other sources were included in some modules of some BP courses. The students would read chapters from a book, which served as the textbook for the course. This book was accessed through the course shell in the LMS in e-book format. Some BP courses included additional readings in the lesson. An outline of one representative module was structured as follows:

1) Lesson 1: Title and Outcomes
2) Watch: Video
3) Read: Chapters, Articles
4) Practice: Contemplations, Self-assessment
5) Explore: Discussion

THE INSTRUCTOR AND FACILITATOR

The instructor of each course was an author whose books are published by BP. He or she was scheduled to work actively on the course only during the first six to eight weeks, in accordance with the six to eight modules that made up a course.

This period will be referred to as the "scheduled" portion of a course. Within this timeframe, he or she would respond to the discussion board and/or send emails that reflected on discussion threads or topics from the lesson. The author also offered two to three live audio conferences for all interested students. In the conference call, the instructor would address a discussion thread or expand on a topic introduced in the lesson, and/or would simply answer questions posed by students. These conference calls were recorded and made available to all students within the LMS course shell.

An instructional designer and administrative staff at BP facilitated technical problems, conference call and course logistics, scheduling issues, and general communication. The instructional designer oversaw facilitation of the course by daily reviewing the discussion threads, communicating weekly with the students through email, and ensuring that the author was cognizant of relevant discussions and general engagement with the course.

Peer-to-peer engagement

The primary vehicle for peer-to-peer engagement was the discussion board. In welcoming enrolled students, the facilitator encouraged them to introduce themselves through a post on the board. Learners could respond to each other's posts and receive emails with new posts and responses by subscribing to the discussion board. Each module included an assignment to post to the discussion board in response to questions relevant to the lesson's topic. The discussion board post was not mandatory.

METHODOLOGY

CoI instrument

Based on the assumption that 15–20% of the student population per course were engaged throughout the course (as the publisher's staff recounted to me anecdotally), I used the CoI survey to measure students' perception of the three presences within seven courses with initiation dates that ran from February 2014 to March 2015. Because the structure and content of the online courses had been consistent throughout this timeframe, a single survey could cover the elements of student engagement in all of the seven courses whose participants completed the survey.

With the intent to drill deeper into students' engagement, I developed an additional questionnaire to interview students for an ongoing course—coded for this study as BPC-8—which began in April 2015. This eighth course ran concurrently with the research period for this study; students of this course were not invited to respond to the online CoI survey. In adapting the framework of the CoI survey, I developed interview questions to capture each one of the categories found in the CoI survey (See Appendix C). I conducted the interviews on the

telephone using Skype and recorded them for my later transcription and coding. The interviews consisted of an initial conversation lasting 15 to 20 minutes, on the average, at three weeks into the scheduled course. This was followed by an additional interview conducted after the final scheduled week to answer questions that might have gone unanswered in the first interview and to discover if the students had changed any of their responses to the questions as the course progressed.

In light of my evolving understanding of how the three presences manifested in these seven courses, I revised the original CoI survey to reflect all of the elements identified within the CoI model as critical to engagement: instructor and facilitator presence, peer-to-peer engagement, and course structure and materials. In addition, I grouped questions by category in order to make the survey appear to be shorter, since I believed that potential respondents might have been deterred from filling out the survey, which included the 34 questions in the original CoI survey (See Appendix A). Re-grouping the questions enabled me to compile a survey that appeared smaller while including all of the original CoI survey's questions (See Appendix B). Below is an example of how I revised questions 32 to 34 in the original survey.

Resolution

32. I can describe ways to test and apply the knowledge created in this course.
33. I have developed solutions to course problems that can be applied in practice.
34. I can apply the knowledge created in this course to my work or other non-class related activities.

I revised this category of *Resolution* under Cognitive Presence by grouping the questions under a common introductory statement and editing questions 33 and 34 to reflect how BP students would apply their knowledge, for either personal transformation or professional development (a number of students in the courses are practitioners and teachers):

Resolution

13. In reflecting on what I absorbed from the course,
    - I can describe ways to use and apply the knowledge created in this course.
    - I have practiced skills or applied knowledge gained from this course in professional life.
    - I have practiced skills or applied knowledge gained from this course in my personal life.

ITERATIVE PROCESS: AN ADDITIONAL INSTRUMENT

Having determined the methodology, I began the process of data gathering by confirming the engagement or disengagement of students, class to class, to determine whether the rate of 15–20% was consistent across all of the classes. Findings proved otherwise. The rates of engagement fluctuated from as low as 10% to as high as 36%. (The most recent courses remained open and available for participants until September 2015 and October 2015, respectively. Therefore, engagement rates calculated for these courses in this study report would likely increase, if calculated to include the engagement of those students who completed the courses after the scheduled portions.) Figure 2, below, gives an overview of the percentage of students who completed the final lesson of all eight courses that were part of this study.

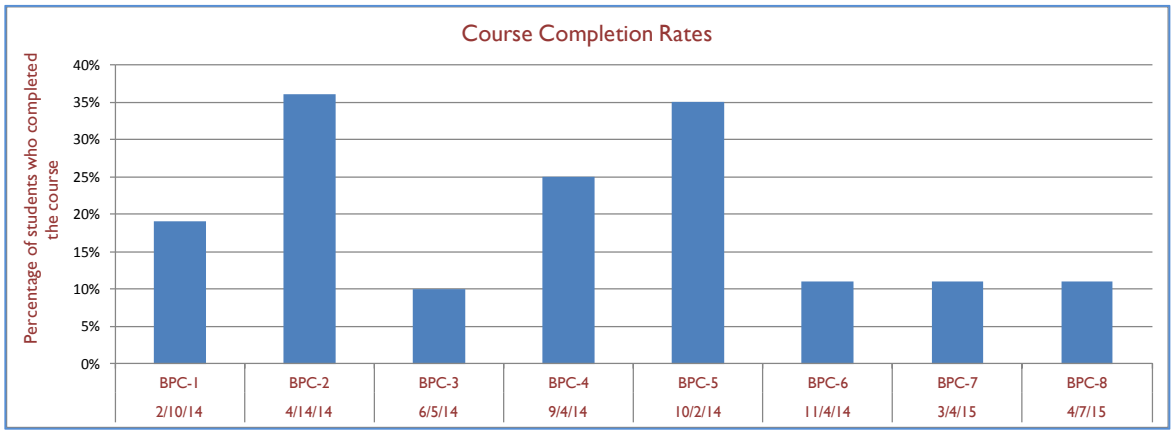


Fig. 2: Course completion rates

Notably, however, the accounting of rate of completion did reveal a consistent trend in what will be called the "dropout" rate. Within the LMS, the administrator could view and count each lesson that the student completed. When counting how many students dropped out at Lesson One or dropped out at Lesson Two, the percentages fluctuated widely. What occurred consistently is that by Lesson Three of a course, 50–70% of the students had dropped out. (The percentages might have decreased for BPC-7 (58%) and BPC-8 (67%) for those students who completed the course after the scheduled portion.)

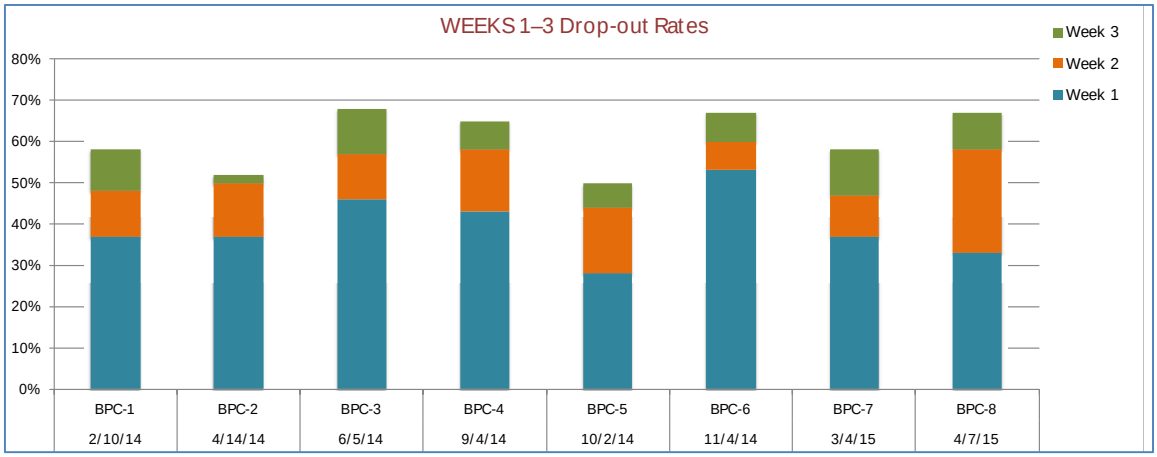


Fig. 3: Week 1–3 dropout rates

The graph in Figure 3 presents the percentage of students who dropped out of courses after completing Lesson Three. This trend revealed two possible concerns about the chosen methodology: 1) A large percentage of the students (50-70%) may not have participated long enough in the course to answer fully all of the questions in the CoI survey; and 2) these students may not have been motivated to fill out a long survey, so survey participation numbers would be low.

In order to address the fact that students who disengaged from courses early in a course might not be motivated to complete the survey, I revised the study methodology to include analysis of data from a second survey, called Disengagement Questionnaire (DQ). Students in each of the seven courses examined were separated into two lists. Students who completed Lesson Four through the end of a course received the full-length version of the modified CoI survey. Since these students had remained engaged for an extended portion of the course, I understood their input to be of high value in seeking to identify aspects of the course that led to engagement. Conversely, students who dropped out at the Third Lesson or earlier received the DQ that consisted of four questions (see Appendix D). This second survey focused on what may have caused or influenced students to disengage, to drop out. This short disengagement survey included questions about students' level of engagement with the instructor, with each other, and with course structure and materials.

COMMUNICATIONS

First, all of the publisher's staff email addresses were removed from the email lists. Some staff had signed up to participate. Others had enrolled to review the course, while some were administrators of the course. All communications began with emails to the students in BP courses. These emails explained the purpose of the independent research, invited them to participate, and included the offer of a

discount from the publisher. This one-time discount on a single item available on the BP website would be given to all of those who participated in the study by filling out the surveys or by answering questions in a telephone interview. A follow up email reminded students who had not responded that they could still participate. The two surveys were accessed through an online platform.

RESULTS

COMPARISON BETWEEN INSTRUMENTS OF STUDY PARTICIPANTS

The analysis of the data first required a general overview of the relationship among the three different data sources before considering the relevance of any single data set. In particular, the research involved questioning the relationship of the data from the Disengagement Questionnaire (DQ) and from CoI Interviews (Interview) to data from the full (albeit modified) CoI Survey (CoI). For instance, were the same proportions of respondents from each course represented in the data for both the CoI and the DQ? Did the engagement and disengagement rates of interview participants from BPC-8 correspond with the overall engagement and disengagement rates in the course?

NUMBER OF STUDY PARTICIPANTS

The percentage of respondents to the number of sent email requests was most robust for the full CoI survey at 23% response rate. By comparison, the response rate for the questionnaire (DQ) sent to those who dropped out by the third lesson was 12%, approximately half the response rate of those completing the full CoI survey. However, the overall number of responses was robust—CoI, 228; and DQ, 173. In contrast, the number of respondents for the interviews was low. Initially 29 students volunteered to take part in the interviews. Only 20 students scheduled a time when requested—a 7% response rate.

	CoI	DQ	Interviews
Requests sent	1003	1481	298
Respondents	228	173	20
Percentage response	23%	12%	7%

Table 1: Percentage of respondents to email requests to complete surveys and participate in interviews

PROPORTION OF RESPONDENTS IN COI AND DQ COMPARED TO OVERALL STUDENT POPULATION

As noted in Table 1, student responses in the CoI were highest in number and percentage. In addition, the proportion of students who responded per course was consistent with the proportion of students enrolled in all of the courses. The largest difference in proportion between overall students and number of respondents is 5%, found in the course coded as BPC-3. Notably, only 14% of respondents were enrolled in this course whereas the population of the course constituted 19% of the overall student population. This relatively low response rate reflects the high dropout rate (68%) of this course. A disproportionately large percent of the email queries (24%, as shown in Figure 6) were sent to students who dropped out of BPC-3 by the third lesson of the course and who therefore received the DQ.

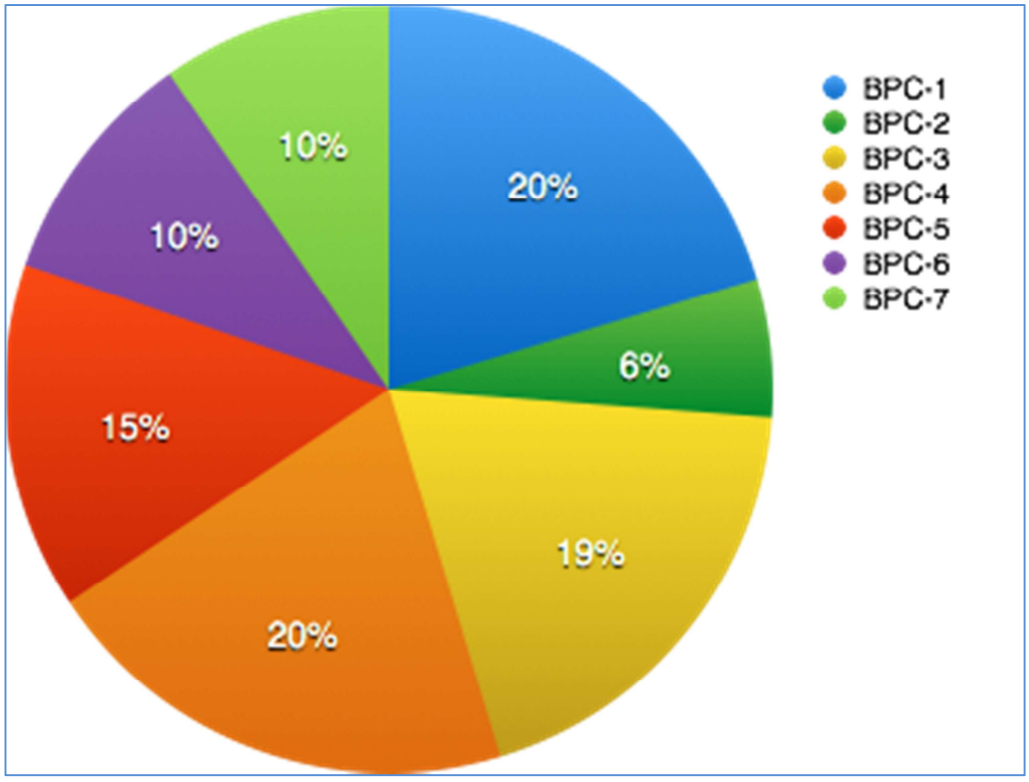


Fig. 4: Proportion of students enrolled in all classes from January 2014 to March 2015

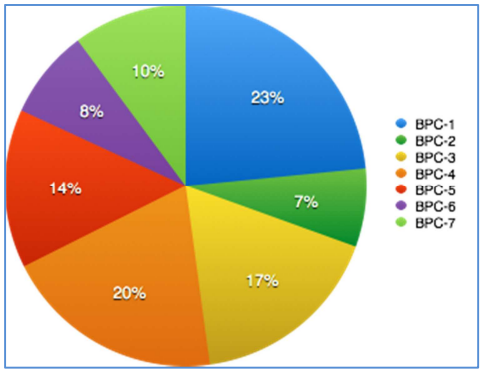


Fig. 5: CoI: Proportion of students per course sent email queries to participate in the study

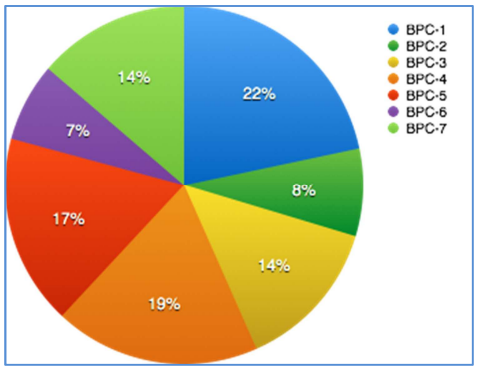


Fig.6: Proportion of respondents to Community of Inquiry survey, per course

Likewise, the proportion of students who responded per course to the DQ closely corresponded to the proportion of students enrolled in all of the courses. The largest difference between overall students and number of respondents is 5%, found in the courses coded as BPC-3 and BPC-4. In addition, in the case of BPC-3 respondents, there is a 6% disparity between the proportion of students who received the email query (24%) and the number of respondents (18%).

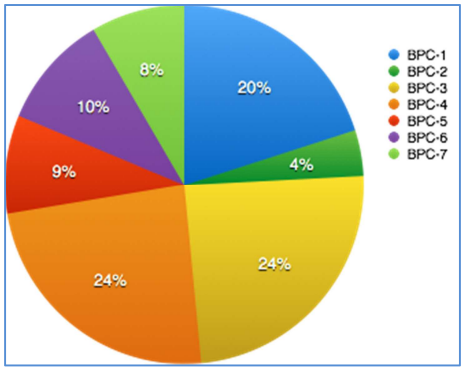


Fig. 7: DQ: Proportion of students per course sent two email queries

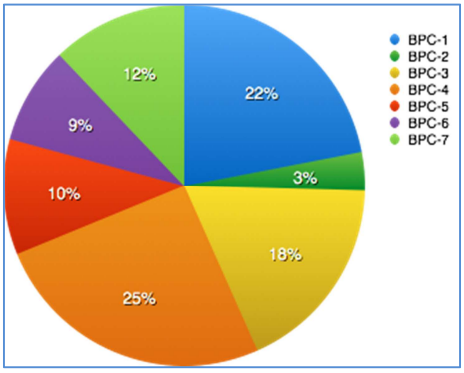


Fig.8: Proportion of respondents to Disengagement Questionnaire, per course

Engagement of Interviewees

Twenty-nine students who had enrolled in the course coded as BPC-8 volunteered to be interviewed for this study. However, only 20 followed through by signing up for a time to be interviewed. One individual considered the scheduling process "too complicated." Two other volunteers had not started the course, so they declined. Six others who initially volunteered never replied in any fashion when

invited to sign up for an interview time. At the time when the scheduled portion of BPC-8 was complete, nine interviewees were still working through the first three lessons of the class, and 11 interviewees were working within the last three lessons, with the remaining seven interviewees having completed the course.

	Lesson 1	Lesson 2	Lesson 3	Lesson 4	Lesson 5	Lesson 6	Completed
Interviewees	1	6	2	2	0	2	7

Table 2: Number of consecutive lessons completed within HAR by interviewees

Comparison of the dropout rates for the twenty interviewees versus the entire student population in the BPC-8 course reveal that the students who were interviewed had a higher completion rate. Specifically, the completion rate for those who interviewed was 35% as compared to 11% for the class as a whole. The interviewees were more engaged in the course than the general student population.[1] Of the ten students who took part in follow-up interviews after the scheduled portion was complete, all of those who had not completed the course in its entirety stated that they were still active in the course and intended to complete the course within the ensuing six-month time period throughout which the BPC-8 would remain accessible.

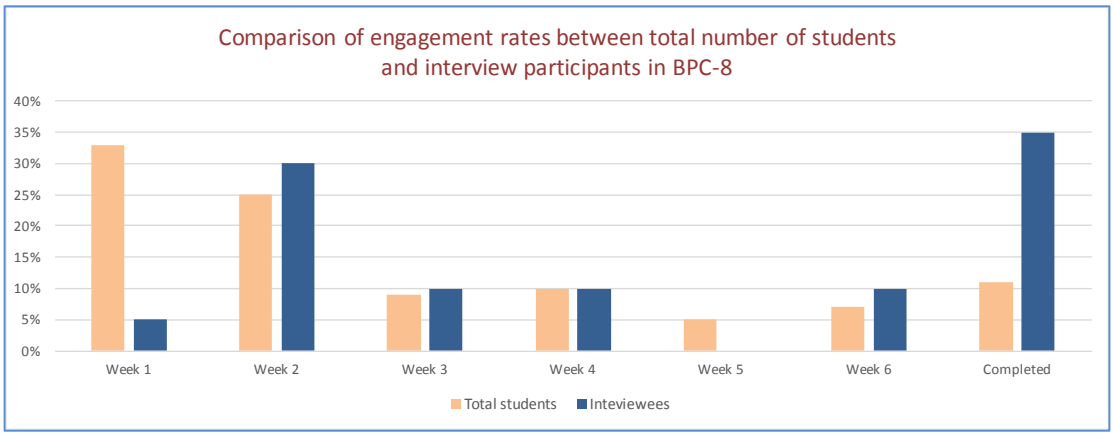


Fig. 9: Comparison of engagement rates between the total number of students (in beige) and interview participants (in blue) in the BPC-8 course.

[1] As a reminder, 67% of the students in this course might not have continued after Lesson 3 (see Figure 2), a trend of disengagement in BP courses. Since the course was to remain available for several months, the percentage of students who dropped out within the course's first three lessons might have decreased significantly after the completion of this study.

Since the majority of interview participants remained more engaged than the general course population throughout the scheduled portion of the course, it could be expected that they would be more engaged in each of three areas of engagement defined with the CoI model. The insights from the interviews could have relevance for triangulating results of the CoI survey but would yield no insights with regard to results of the DQ survey, since the DQ survey was administered to and completed by students from the course at large, all of whom disengaged by the third lesson of the course.

Results from CoI full survey

The CoI survey included introductory background questions bearing on the following three data sets:

1) the course that the student chose to review for the survey;
2) the student's general motivation for taking the course
   — personal or professional reasons;
3) whether the student completed the course

Students who had not completed the course were urged to complete an open-ended response to explain their reason(s) for not completing the course. (The DQ survey focuses on this question.)

In response to the CoI survey, 85% of CoI survey respondents indicated they had enrolled in the courses for personal development; 15% of respondents indicated having enrolled for professional development. Of those who completed the survey, 72% had completed the courses. Of the 28% who did not complete the course, those who chose to explain reasons for not completing provided the following reasons through their open-ended answers:

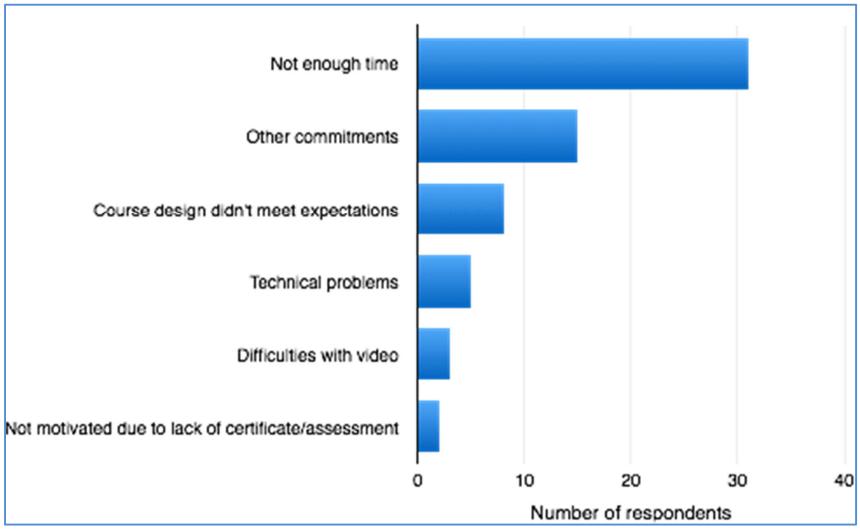


Fig. 10: Reasons for not completing the course

		Strongly agree	Agree	Neutral	Disagree	Disagree	Not applicable
Teaching Presence	1. Clear Lesson Outcomes	132	55	28	9	0	2
	2. Clearly documented instructions	148	52	15	9	2	0
	3. Clearly documented dates	166	44	7	4	2	3
	4. Clearly explained course topics	157	46	14	5	1	2
	5. Lessons designed for engagement	96	45	55	17	3	10
	6. Lessons designed to keep on task for learning	118	54	33	13	6	2
	7. Contributed to community among participants	69	48	73	18	8	0
	8. Responses helped me to learn	109	51	35	7	6	18
	9. Feedback helped me understand strengths and weaknesses	55	27	57	21	14	52
	10. Feedback relevant to the discussion	98	44	41	9	5	29
Social Presence	11. Got to know other participants	12	18	71	40	38	47
	12. Formed distinct impressions of course participants	15	32	71	30	41	37
	13. Online communication excellent for social interactions	16	26	73	45	36	0
	14. Converse through the online medium	14	19	76	50	51	16
	15. Participated in course discussions	14	35	70	49	38	20
	16. Interacted with individuals	8	20	65	51	57	25
	17. I felt comfortable disagreeing with others	11	30	80	10	7	88
	18. My point of view acknowledged by others	16	21	73	9	7	100
	19. Online discussion developed sense of collaboration	14	34	75	24	26	53

Cognitive Presence	20. Learning increased by discussion questions	42	76	56	24	9	19
	21. Learning was increased by homework practices	91	86	32	9	3	5
	22. Learning was increased by videos	159	48	10	3	4	2
	23. Learning was increased by assigned readings	158	55	9	1	1	2
	24. Video and readings provided context	151	53	12	2	2	6
	25. Online discussions helped me appreciated different perspectives	47	58	54	30	11	26
	26. Combining new information helped me answer questions in activities	72	69	61	3	3	18
	27. Learning activities helped integrate content into daily or professional life	107	72	33	6	3	5
	28. Reflection on course content helped me understand fundamental concepts	118	76	24	2	1	5
	29. I can use and apply the knowledge gained in this course	110	73	28	6	4	5
	30. I have practiced skills/applied knowledge in professional life	86	66	29	7	7	33
	31. I have practiced skills/applied knowledge in personal life	120	74	21	7	1	1

Table 3: Results from Community of Inquiry full survey

The results from the CoI survey reveal an overall positive view of the publisher's courses in the areas of Teaching and Cognitive Presences. However, the ratings for Social Presence were less favorable than the ratings for other measures. Table 3 above provides cumulative results of the CoI survey.

Table 3 shows the totals of responses to the options provided for each question on the CoI full survey. Tables 4 through 6 show the consolidated responses to CoI survey questions related to the three Presences, and the corresponding scatter charts (Figures 11 through 13) provide a clearer representational view of the students' engagement. In order to simplify the charts, the results for "Strongly agree" and "Agree" were combined as were the results for "Strongly disagree" and "Disagree." The other two categories in the chart are "Neutral" and "Not applicable." These charts show that students find strong Teaching and Cognitive Presences. The scatter chart of data from the questions

addressing Social Presence shows the inverse of the other two charts. *The numbers on the x-axis refer to the number to the right of the question under the "#" column in the tables below.*

Teaching Presence		#	Agree	Neutral	Disagree	Not applicable
Design and Organization	1. Clear Lesson Outcomes	1	187	28	9	2
	2. Clearly documented instructions	2	200	15	11	0
	3. Clearly documented dates	3	210	7	6	3
Facilitation	4. Clearly explained course topics	4	203	14	6	2
	5. Lessons designed for engagement	5	141	55	20	10
	6. Lessons designed to keep on task for learning	6	172	33	19	2
	7. Contributed to community among participants	7	117	73	26	0
Direct Instruction	8. Responses helped me to learn	8	160	35	13	18
	9. Feedback helped me understand strengths and weaknesses	9	82	57	35	52
	10. Feedback relevant to the discussion	10	142	41	14	29

Table 4: Consolidated responses to Teaching Presence

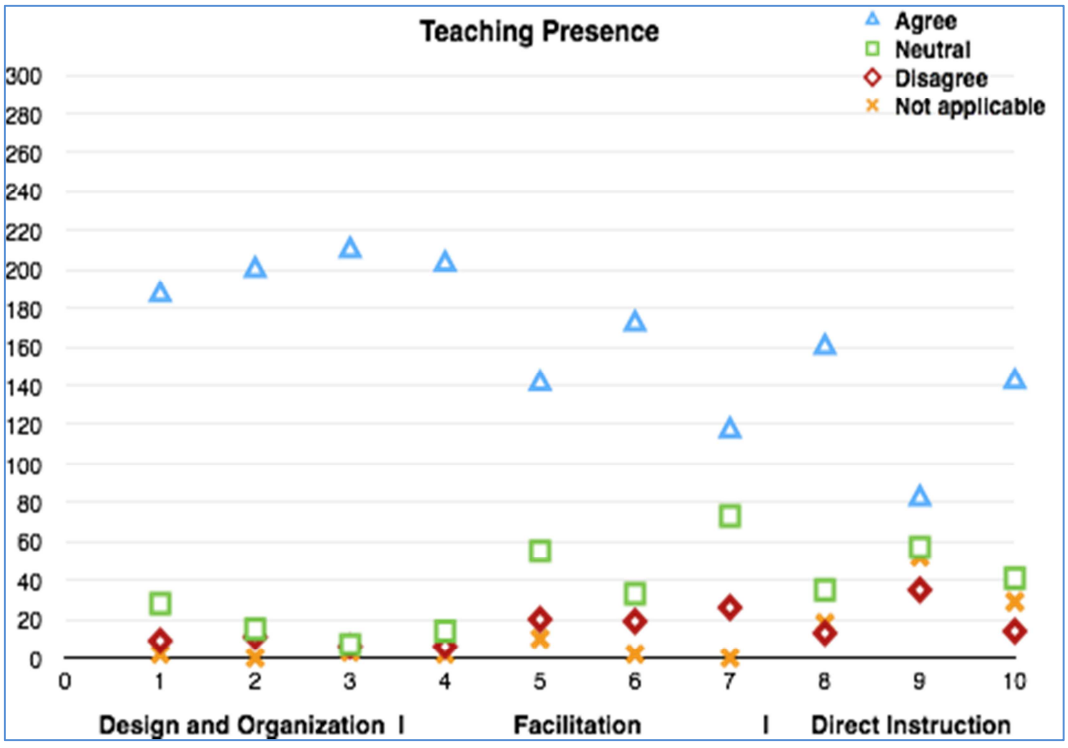


Fig. 11: Scatter chart of responses to Teaching Presence

Cognitive Presence		#	Agree	Neutral	Disagree	Not applicable
Triggering Event	20. Learning increased by discussion questions	1	118	56	33	19
	21. Learning was increased by homework practices	2	177	32	12	5
	22. Learning was increased by videos	3	207	10	7	2
	23. Learning was increased by assigned readings	4	213	9	2	2
Exploration	24. Video and readings provided context	5	204	12	4	6
	25. Online discusssions helped me appreciated different perspectives	6	105	54	41	26
Integration	26. Combining new information helped me answer questions in activties	7	141	61	6	18
	27. Learning activities helped integrate content into daily or professional life	8	179	33	9	5
	28. Reflection on course content helped me understand fundamental concepts	9	194	24	3	5
Resolution	29. I can use and apply the knowledge gained in this course	10	183	28	10	5
	30. I have practiced skills/applied knowledge in professional life	11	152	29	14	33
	31. I have practiced skills/applied knowledge in personal life	12	194	21	8	1

Table 5: Consolidated responses to Cognitive Presence

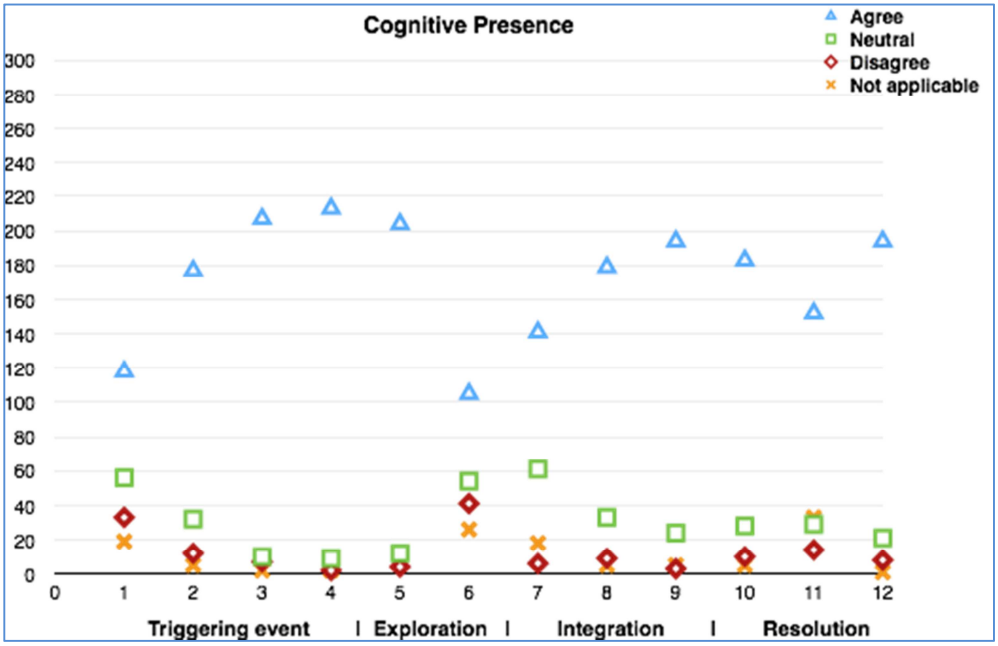


Fig. 12: Scatter chart of responses to Cognitive Presence

Social Presence		#	Agree	Neutral	Disagree	Not applicable
Affective expression	11. Got to know other participants	1	30	71	78	47
	12. Formed distinct impressions of course participants	2	47	71	71	37
	13. Online communication excellent for social interactions	3	42	73	81	0
Open Communicatior	14. Converse through the online medium	4	33	76	101	16
	15. Participated in course discussions	5	49	70	87	20
	16. Interacted with individals	6	28	65	108	25
Group Cohesion	17. I felt comfortable disagreeing with others	7	41	80	17	88
	18. My point of view acknowledged by others	8	37	73	16	100
	19. Online discussion developed sense of collaboration	9	48	75	50	53

Table 6: Consolidated responses to Social Presence

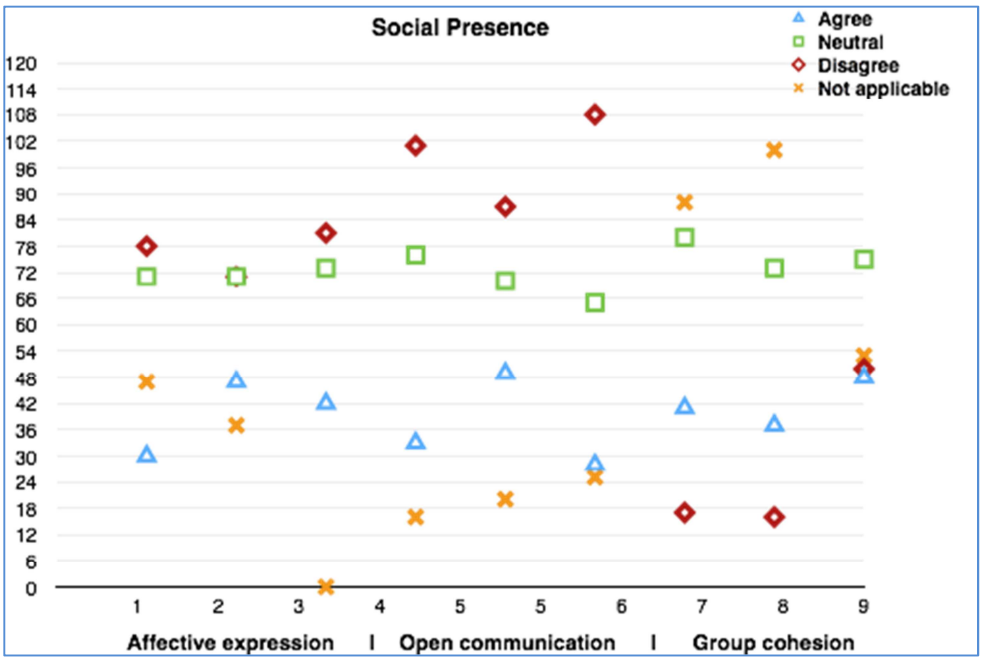


Fig. 13: Scatter chart of responses to Social Presence

CoI full survey respondents consistently selected the "Neutral" and "Not applicable" categories more frequently when addressing questions pertaining to Social Presence than when addressing questions pertaining to Cognitive and Teaching Presences.

INTERVIEW RESULTS

The interview questions were designed to address learners' perceptions regarding each category covered in the CoI model. However, because the answers were open-ended, they created a unique set of variables to be analyzed. As was true, generally, for respondents of the CoI survey, the students interviewed had a robust engagement rate relative to the overall student population (see Figure 9). However, interview participants were unlike the CoI participants in that half (50%) of the interviewees enrolled for professional development purposes while the other half enrolled for personal reasons.

The bar graphs below address interview results relating to the variables created for each Presence. For the responses to questions addressing the Teaching Presence, variables fell under two primary categories: interaction with the instructor and weekly contribution by the instructor. I deemed irrelevant a third category: Satisfaction with response from the course facilitator or instructor when queried by student. Students were asked about receiving feedback from any questions they may have put to the facilitator or instructor. However, interview data indicated that only two students asked questions. These two students asked only one question each and both questions pertained to technical support for course communications, thus deemed irrelevant to the course topics. I therefore conclude that responses to inquiries had no significant influence on learners' levels of engagement with or absorption of the material. When asked to give feedback regarding weekly contributions on the part of the instructor, students indicated that instructors made few contributions to the discussion boards but students indicated they read the instructor's weekly emails initiated during the third week of the class. Overall, the students provided positive feedback regarding the instructor's presence. When asked if they would like more interaction with the instructor in forums other than the discussion board, conference call, or weekly emails, six students asserted additional interaction forums were not necessary. Six students stated they would have preferred more interactions but could not define the form such interaction might take; six students wanted the opportunity to interact with the instructor on an individual basis; and two students would have preferred video conferences rather than the existing audio conferences to enable a more dynamic experience with the instructor and fellow students. The graph in Figure 14, below, represents interview data regarding perceptions of Teaching Presence.

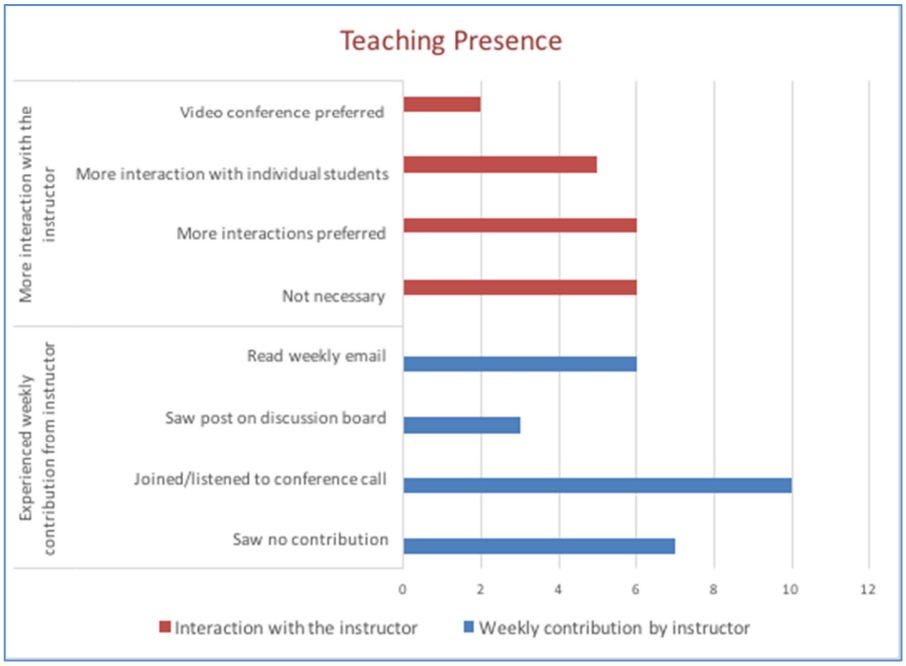


Fig. 14: Teaching Presence as described in interviews

The interview questions bearing on Social Presence elicited information on learners' perceptions regarding the following:

1) Posting to the discussion board;
2) Experiences with inhibitions about responding to posts;
3) The ability to sense different personalities;
4) Feeling of being part of the community.

Eight out of 20 respondents indicated they posted regularly to the discussion board while 11 out of 20 read their classmates' posts on a regular basis; five of the respondents (25%) indicated they were not interested in engaging through the discussion board while seven had responded to a classmate's post at least one time. When asked what might inhibit them from posting, interviewees' responses varied, including these inhibiting factors: wanting anonymity, desiring a smaller class size, not having enough time, finding that the discussions were not engaging, feeling there was a lack of feedback to their own posts, and finally, not being interested in the discussion forum. An interviewee might have named more than one of the inhibitors listed above. Half of the interviewees stated they were not inhibited in any way.

When asked if they could sense their classmates' personalities from the discussions, ten respondents (50%) said "Yes" while the other 50% were either ambivalent or replied in the negative. When asked if they felt part of a learning community, eight out of 20 said "No," five were uncertain, and six responded affirmatively. One student did not respond. Figure 15 represents these findings.

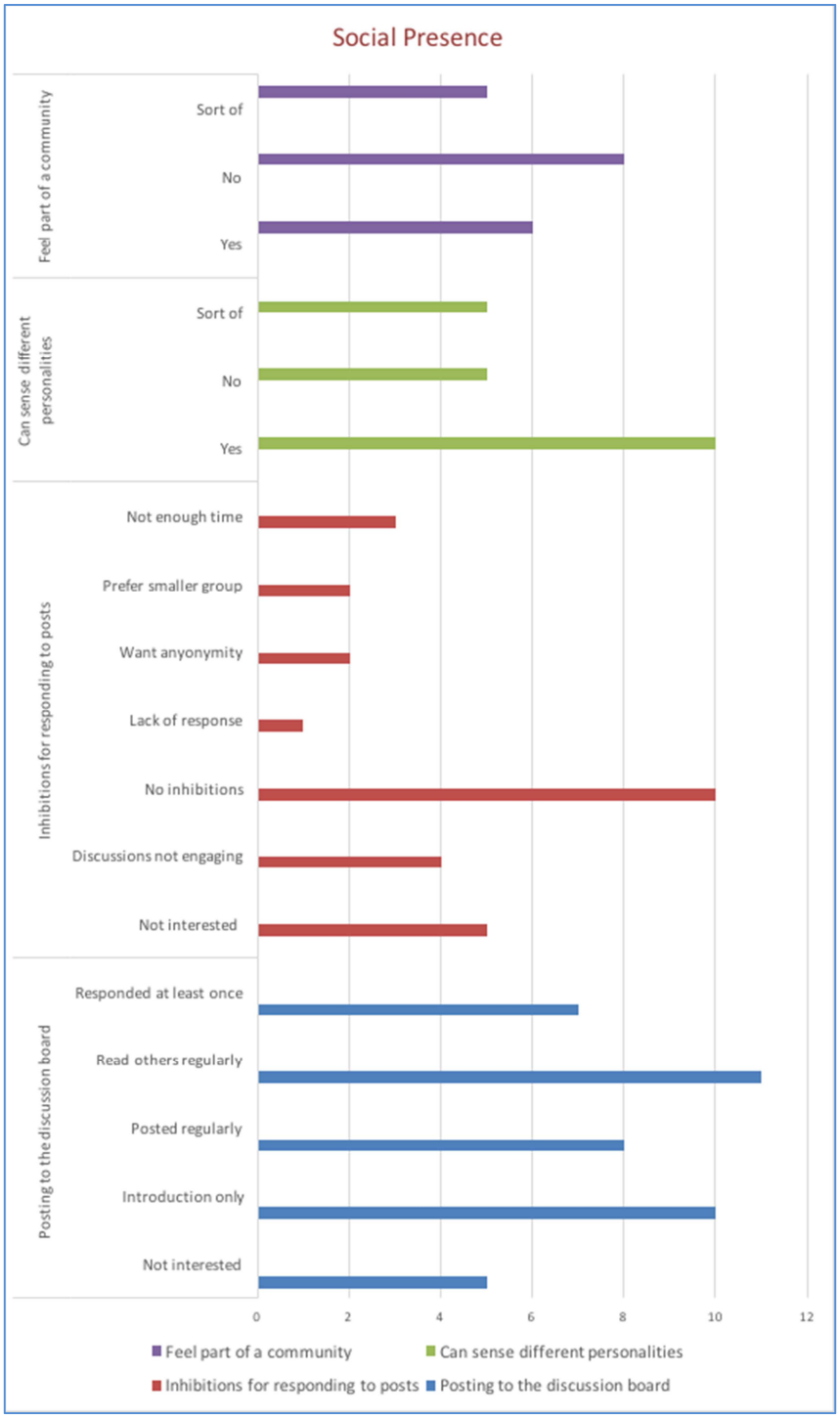


Fig. 15: Social Presence as described in interviews

Interview questions regarding Cognitive Presence focused on:

1) Appropriate instructional videos;
2) Relevant assignments and practices;
3) Insights from classmates;
4) Students' application of knowledge.

In contrast to the nuanced responses interviewees provided in response to questions regarding Social Presence, their replies to interview questions regarding Cognitive Presence were straightforward. All interviewees agreed that the assignments and practices were relevant to the weekly lessons. On a par with this feedback, 17 out of 20 respondents indicated they had found the videos engaging. Only one student indicated the videos were not engaging. Two of the four students who mentioned that the videos contained distracting elements had experience in video production. Only two students replied that they had not applied what they learned. Finally, a minority of five students indicated they had gained insights from their classmates' posts on the discussion board. The rest indicated they were either not interested in or had gained no insight from classmates' discussion posts. Figure 16, provides a graphical representation of these interview findings regarding Cognitive Presence.

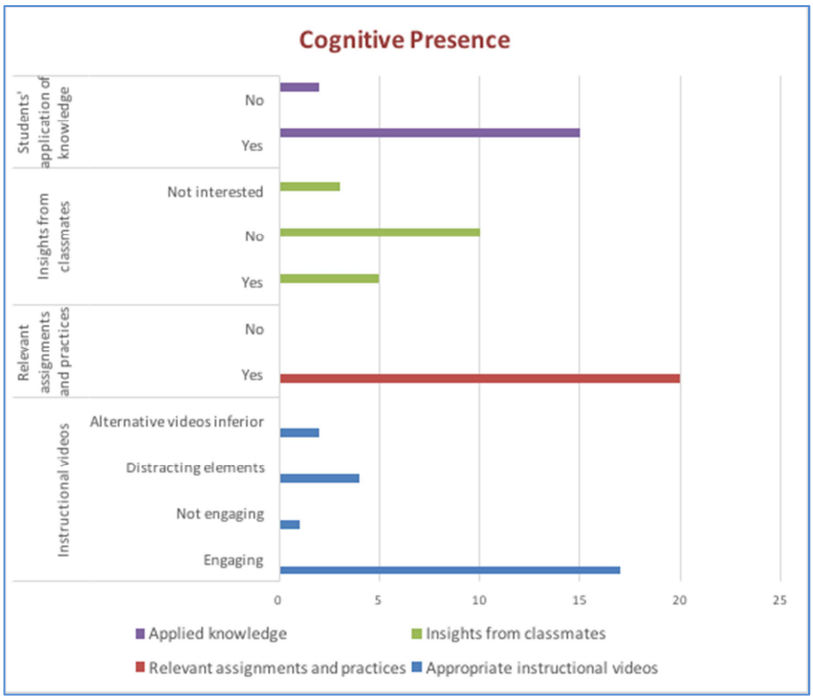


Fig. 16: Cognitive Presence as described in interviews

As part of the introduction to the interview, the students were asked if they had taken an online course prior to enrolling in BPC-8. Most of the interviewees (80%) had participated in online courses. This same question was asked of students who filled out the Disengagement Questionnaire (DQ). Among students who completed the DQ, responses were nearly evenly split with 52% indicating they had previously taken an online course and 48% indicating the BP course had been the first online course in which they had participated. Figure 17 represents this data graphically.

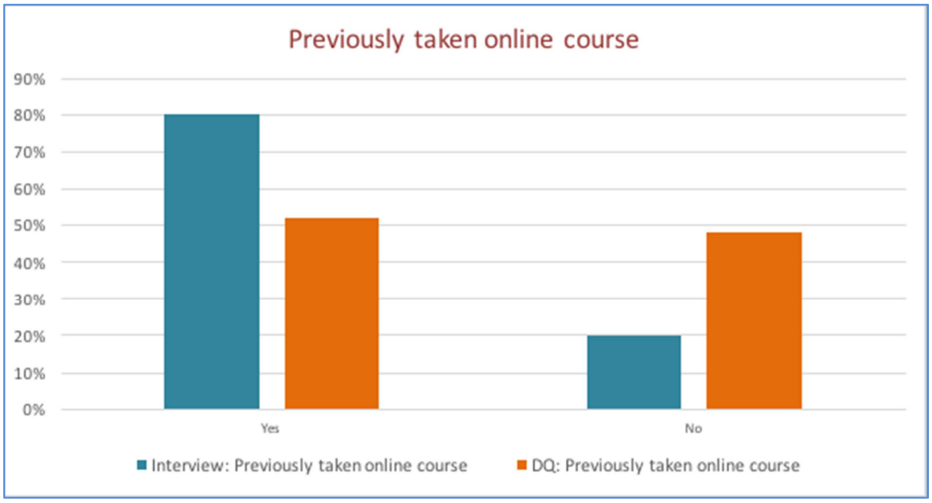


Fig. 17: Percentages of students interviewed and responding to the Disengagement Questionnaire who had previously taken an online course

DISENGAGEMENT QUESTIONNAIRE RESULTS

The DQ was limited in scope and designed to gain better understanding of what caused students to drop out of a course for which they had paid a registration fee. The students were given a selection of responses to determine levels of engagement with the instructor, with the materials, and with their peers. They also had the opportunity to give an open-ended response. Including both the given responses and the responses to open-ended answers, 57% of the students (99 out of 173) responded that "other commitments" had caused them to disengage from the course. The other variables from "technical problems," "structure confusing," "didn't meet expectations," and so on down the list were selected at a response rate of 17% or less. The chart in Figure 18 lists all of the reasons DQ respondents indicated had led them to disengage from BP courses by the third lesson.

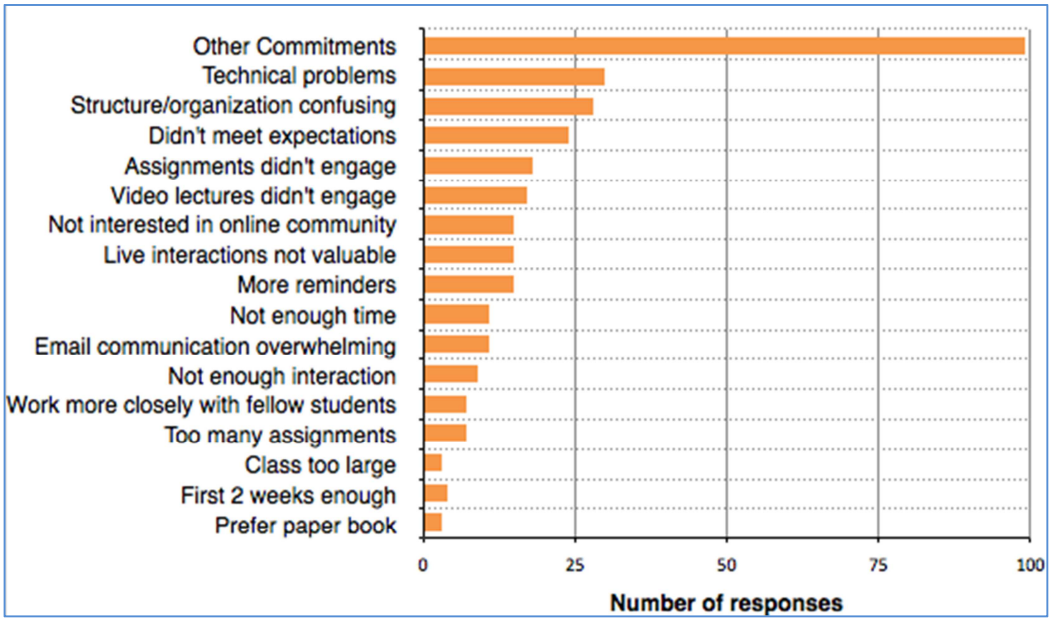


Fig. 18: Reasons for disengaging from courses by the third lesson

The primary reason for early disengagement selected by DQ respondents, "Other commitments," corresponds with the open-ended answers CoI survey respondents provided for disengaging. CoI survey data indicate respondents' primary reasons for disengaging were "Not enough time" and "Other commitments." (See Figure 10).

DISCUSSION

For the purpose of analyzing study results, it is helpful to recall that the focus of this research has been to ascertain if low engagement rates in large online courses correlate with learners' perceptions of a weak Social Presence, Teaching Presence, and/or Cognitive Presence as measured through variants of the Community of Inquiry instrument. In addition, an underlying consideration is whether the study substantiates the use of the CoI survey as a tool to measure a student's engagement or non-engagement in a large online course.

The data reveal that students in BP courses have positive perceptions of Teaching and Cognitive Presences (as shown in Figures 11 and 12). However, they have an ambivalent to negative perception of Social Presence (as shown in Figure 13). To a degree, these student perceptions are similarly borne out within the data collected through interviews. Interview data indicate that even the highly engaged students were ambivalent about interacting with each other through the discussion boards, the only venue provided for creating a Social Presence among

peers. The responses to the interview questions posed about Social Presence (shown in Figure 15) were more nuanced than were responses to questions about Teaching and Cognitive Presences. The responses regarding the materials and activities implemented in the course are unequivocally positive.

Students have a generally positive view of the course design. What they perceive as limiting are the options for peer interaction and for the formation of learning community. This view can be summed up in the following comment by one of the interviewees:

> It doesn't feel like I'm going through the course with other people. It's overwhelming. In [an online course offered by a different organization], they broke us up into smaller groups and we developed an understanding of who folks are. It was in smaller group discussions that I think helped me feel more connected with fellow students and the instructor. I can't track that many people [in the BPC-8 course].

The findings from this study can inform the implementation of BP courses. The study data indicate that large class size does adversely affect how students interact with each other. Furthermore, this finding is consistent with literature in the field. In a literature review of research on evaluating social presence, David Annand of Athabasca University explains that, in one study he reviews, "the main technique that produced the observed effects [strong social presence] was the one-on-one peer review, not group-based interaction, and this was an unexpected result" (p. 44). Annand further elaborates "that instructional design focusing learners on a major course requirement [through the discussion board] was the essential element contributing to the development of higher-order cognitive presences and that one-on-one peer review activities that require neither collaborative activities nor intentional creation of social presence are preferable" (p.45). In other words, use of the discussion board contributes more to fostering learners' perceptions of Cognitive Presence than to promoting Social Presence; a discussion board may not be an effective forum for creating a wider community of learners. Alternative or additional forms of interaction should be considered if a goal of the publisher's online course program is to create a learning community within individual courses.

While the CoI does reveal a weakness of low Social Presence in the design and implementation of BP courses, a correlation cannot be directly linked to low engagement rates. Both the CoI survey and DQ markedly reveal that most students disengage from a course due to personal conflicts: other commitments or not enough time. Even so, some who indicated they had disengaged due to "other commitments," also took issue with the class size, course design, and peer interaction. One respondent made the following comment:

> I believe that there were too many participants and e-mails. We could have been put into smaller groups and communicated with one another about the material, and then also offer questions to the instructor and have time with the instructor as well. I also believe that something was missing (not sure what) but maybe to hold the participants accountable, send reminders on benchmarks, have workshop leaders to help make the course more interactive, and so on. I just gave up after having read the book. It [the course] was complicated as well.

Because the observations provided by this study are few in number, the correlations established in the study in regard to BP courses bear replication both for further examination of this context and if (or when) applied for study of other contexts.

CONCLUSION

In conclusion, the Community of Inquiry survey can effectively measure students' engagement within a large online course to assess the efficacy of its design and implementation; however, the survey cannot conclusively determine if low engagement rates are due to an inability to engage students through strong peer interaction. The amount of data gathered for this study allows one to further investigate students' engagement in individual courses, which could enrich the analysis. Some courses had higher registration fees. It would be interesting to see if a correlation could be drawn between higher registration fees and higher engagement rates. The scope of the research reported herein has limited the focus to an overview of the design and implementation. Other limitations to this study were caused by inconsistencies of background questions between the CoI survey, the Interviews, and the Discussion Questionnaire. Each instrument had a different focus which dictated the choice of questions. However, the three instruments could have been better coordinated. For instance, an opportunity was lost by not asking respondents of the CoI if they had previously enrolled in an online course, although I did pose this question to DQ and interview respondents. The interviewees were more engaged than the average of students in the course in which they were enrolled and proportionately more of them had experience with taking an online course than students who responded to the DQ. If CoI respondents had been queried and were found to be proportionately more experienced as well, then the research could have noted correlations regarding engagement levels of students with experience in online courses.

While this research has been informative in determining strengths and weaknesses in the publisher's online courses, it has not shown correlation between students' disengagement and the design and implementation of large

online courses in general. However, the data and analysis could inform the development of an instrument and/or study that could help determine if a course could be designed such that within the first three weeks of active group study, students remained sufficiently motivated or engaged with the instruction to complete the course.

REFERENCES

Anderson, T., Dron, J. (2011). Three generations of distance education pedagogy. *International Review of Research in Open and Distance Learning,12*(3). Retrieved from http://www.irrodl.org/index.php/irrodl/article/view/890/1663

Annand, D. (2011). Social presence within the Community of Inquiry framework. *International Review of Research in Open and Distance Learning, 12*(5), 40-56.

Arbaugh, J. B., Cleveland-Innes, M., Diaz, S. R., Garrison, D., Ice, P., Richardson, J. C., & Swan, K. P. (2008). Developing a community of inquiry instrument: Testing a measure of the Community of Inquiry framework using a multi-institutional sample. *Internet And Higher Education, 11*(3-4), 133-136.

Garrison, D. R., Anderson, T., & Archer, W. (2000). Critical inquiry in a text-based environment: Computer conferencing in higher education. *The Internet and Higher Education, 2*, 87-105.

Glance, D., Forsey, M., and Riley, M. (2013). The pedagogical foundations of massive open online courses. *First Monday, 18*(5), 1-12. doi:10.5210/fm.v18i5.4350

Hobson, J. & Young, R. (2015) "EdX CEO Lays Out Disruptive Vision for Higher Ed." *Here & Now*. WBUR, 22 Jan. 2105. Retrieved from: http://hereandnow.wbur.org/2015/01/22/edx-moocs-anant-agarwal

Rubin, B., Fernandes, R. (2013). Measuring the community in online classes. *The Journal of Asynchronous Learning Networks, 17*(3). 115-136. Retrieved from http://sloanconsortium.org/jaln/v17n3/measuring-community-online-classes

APPENDIX A

Community of Inquiry Survey Instrument, draft v14
(https://coi.athabascau.ca/coi-model/coi-survey)

Teaching Presence

Design & Organization

1. The instructor clearly communicated important course topics.
2. The instructor clearly communicated important course goals.
3. The instructor provided clear instructions on how to participate in course learning activities.
4. The instructor clearly communicated important due dates/time frames for learning activities.

Facilitation

5. The instructor was helpful in identifying areas of agreement and disagreement on course topics that helped me to learn.
6. The instructor was helpful in guiding the class towards understanding course topics in a way that helped me clarify my thinking.
7. The instructor helped to keep course participants engaged and participating in productive dialogue.
8. The instructor helped keep the course participants on task in a way that helped me to learn.
9. The instructor encouraged course participants to explore new concepts in this course.
10. Instructor actions reinforced the development of a sense of community among course participants.

Direct Instruction

11. The instructor helped to focus discussion on relevant issues in a way that helped me to learn.
12. The instructor provided feedback that helped me understand my strengths and weaknesses.
13. The instructor provided feedback in a timely fashion.

Social Presence

Affective expression

14. Getting to know other course participants gave me a sense of belonging in the course.
15. I was able to form distinct impressions of some course participants.
16. Online or web-based communication is an excellent medium for social interaction.

Open communication

17. I felt comfortable conversing through the online medium.
18. I felt comfortable participating in the course discussions.
19. I felt comfortable interacting with other course participants.

Group cohesion

20. I felt comfortable disagreeing with other course participants while still maintaining a sense of trust.
21. I felt that my point of view was acknowledged by other course participants.
22. Online discussions help me to develop a sense of collaboration.

Cognitive Presence

Triggering event

23. Problems posed increased my interest in course issues.
24. Course activities piqued my curiosity.
25. I felt motivated to explore content related questions.

Exploration

26. I utilized a variety of information sources to explore problems posed in this course.
27. Brainstorming and finding relevant information helped me resolve content related questions.
28. Online discussions were valuable in helping me appreciate different perspectives.

Integration

29. Combining new information helped me answer questions raised in course activities.
30. Learning activities helped me construct explanations/solutions.
31. Reflection on course content and discussions helped me understand fundamental concepts in this class.

Resolution

32. I can describe ways to test and apply the knowledge created in this course.
33. I have developed solutions to course problems that can be applied in practice.
34. I can apply the knowledge created in this course to my work or other non-class related activities.

5 point Likert-type scale

1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree

APPENDIX B

Revised CoI Survey

Introductory Questions

I registered for (list of courses to select from)

My reason for registering was for (select all that apply)

- Personal development
- Professional development
- Other (explain)

Did you complete the course?

- Yes
- No
- If no, please explain what caused you to discontinue the course.

The following questions will be measured on the Likert scale below:
1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree, Not applicable

Teaching Presence

Design & Organization

The facilitator

- Clearly documented important lesson outcomes.
- Clearly documented instructions on how to participate in the course.
- Clearly documented important dates, such as the live calls with the instructor.

Facilitation

The instructor or facilitator

- Explained course topics in a way that helped me clarify my thinking.
- Designed the lessons so that I remained engaged and participated in dialogue.
- Designed the lessons so that I kept on task in a way that helped me to learn.
- Created the opportunity to explore new concepts in this course.
- Contributed to a sense of community among course participants.

Direct Instruction

The instructor or facilitator

- Provided responses that helped me to learn.
- Provided feedback that helped me understand my strengths and weaknesses.
- Provided feedback relevant to the discussion.

Social Presence

Affective expression

While participating in the activities and discussions,

I experienced getting to know other course participants.

I was able to form distinct impressions of some course participants.

I found online communication to be an excellent medium for social interaction.

Open communication

I felt motivated to

Converse through the online medium.

Participate in the course discussions.

Interact with individual course participants.

Group cohesion

When taking into consideration the group dynamics in the course,

I felt comfortable disagreeing with other course participants while still maintaining a sense of trust.

I felt that my point of view was acknowledged by other course participants.

Online discussions help me to develop a sense of collaboration.

Cognitive Presence

Triggering event

My interest in the course

Was increased by the discussion questions.

Was increased by the homework practices.

Was increased by the video lectures.

Was increased by the assigned readings.

Exploration

While working on homework practices or responding to the discussion question,

Video content and readings provided helpful context.

Online discussions were valuable in helping me appreciate different perspectives.

Integration

In applying what I learned in a lesson,

Combining new information helped me answer questions raised in course activities.

Learning activities helped me to integrate an understanding of the content into my daily life or professional practice.

Reflection on course content and discussions helped me understand fundamental concepts in this class.

Resolution

In reflecting on what I absorbed from the course,

I can describe ways to use and apply the knowledge created in this course.

I have practiced skills or applied knowledge gained from this course in professional life.

I have practiced skills or applied knowledge gained from this course in my personal life.

APPENDIX C

Interview Questions

First Opening/Warming:

1. Have you taken an online course before?

Why did you choose this course?

Were you familiar with the instructor's writings and/or practice before registering for the course?

Instructor Presence

Do you think the instructor has contributed to the course discussion on a week-to-week basis? In what way?

When you have asked a question of the instructor or facilitator, are you satisfied with the response and the timeliness of the response?

Would you like more interaction with the instructor or facilitator? If yes, what would you suggest?

Social Presence

Did you post to the discussion board? How often? Did you read the other posts? Did you respond to posts, whether a follow-up to a response on your post or to someone else's post?

Did anything inhibit your response, such as a delayed response from a classmate, not enough time in the week, a discomfort with posting in an online forum?

Do you feel like you can sense the different personalities of your classmates based on the discussion posts?

Do the discussion board postings make you feel that you are part of a group with a similar interest in the topic? (Ask for more explanation)

Cognitive Presence

What did you think of the author's videos in each lesson? Did you find them insightful, engaging?

Were the assigned readings and homework practices relevant to the week's topic?

Did your classmates' postings on the discussion board further advance your grasp of the topic in the lesson? Did you gain a different perspective?

Have you applied what you've learned so far in your daily life?

APPENDIX D

Disengagement Questionnaire

1. I registered for (list of courses to select from)

– Had you taken an online course prior to enrolling in the [publisher's] course?
  Yes
  No

– I didn't complete the course because: (check all that apply)
  Other commitments arose that took priority over the course.
  I was able to get everything that I needed from the course in the first two weeks.
  There wasn't enough interaction with the instructor.
  I did not find the live interactions with the instructor (on the forums or on calls) valuable
  There were too many assignments.
  The assignments/homework practices didn't engage me.
  I was not interested in participating in the online community.
  The video lectures didn't engage me.
  I would like to have worked more closely with my fellow students.
  I found the structure/organization of the course confusing.
  I encountered technical problems with accessing the course.
  I found the email communication from the courses overwhelming.
  I would like to have received more reminders about course assignments and lectures.
  Other

– If given the time and opportunity, would you sign up again for an online course offered by [the publisher]?
  Yes
  No

MOVING BEYOND MOOC MANIA: LESSONS FROM A FACULTY-DESIGNED MOOC

Julia Parra
New Mexico State University

ABSTRACT

Massive open online courses (MOOCs) have attracted fame, perhaps even notoriety, in recent years. However, we have yet to articulate clearly the purpose and potential for MOOCs. Moreover, we lack established best practices in the process of designing MOOCs. We lack models for practical use by faculty and early career instructional designers, whose group members function with limited resources but would like to engage in the intriguing process of MOOC design. The first goal for this case study is to demonstrate how a MOOC titled Adventures in Learning Design, Technology, and Innovation (#LDTIMOLO) was developed following the ADDIE framework and theoretical perspectives of heutagogy and connectivism, and how that MOOC was evaluated with an emphasis on learner engagement. The second goal is to discuss the purpose and potential power of MOOCs and to reveal the surprising impact on graduate students that resulted from "wrapping a course around a MOOC" (Bruff, Fisher, McEwen, & Smith, 2013). The study explores questions regarding:

1. How was ADDIE used in the design of #LDTIMOLO?
2. What does engagement look like in #LDTIMOLO?
3. What are the design lessons learned from evaluating #LDTIMOLO?
4. What is the purpose of a MOOC?
5. What are the reasons that participants took this MOOC (#LDTIMOLO)?
6. What is the role of a MOOC instructor/facilitator?
7. What is the impact of #LDTIMOLO on the participating graduate students?
8. What is the best course of action for me moving forward with faculty-designed MOOCs?

KEYWORDS: ADDIE, connectivism, heutagogy, learner engagement, MOOC, MOLO, online course design

MOVING BEYOND MOOC MANIA: LESSONS FROM A FACULTY-DESIGNED MOOC

Julia Parra[xxii]
New Mexico State University

THE PURPOSE OF MOOCS

> *"[L]earning something new, challenging oneself, setting goals and achieving them should be something natural in human life, for it is only through continuous growing that progress happens. Doing the contrary is equal to getting lost. If you stop dreaming, you stop living*."
> (Mouloud Kessir, in Sokolik & Zemach, 2014, Chapter 6, Section 3, para.8)

Consider that there are many purposes of MOOCs. However, scholars have found it challenging to develop a clear listing and categorization of the purposes of MOOCs. While MOOCs have many purposes, scholars have found it challenging to develop a clear listing and categorization of those purposes. One reason for this might be the diversity of stakeholders invested in MOOC development including various types of educational institutions, MOOC providers, educators and researchers, any individual with an idea or skill to share, and a literal world of learners eager to access high quality online learning opportunities. So, why do a MOOC? Yuan, Powell, & CETIS (2013) answer the question as follows:

> The motivation for some MOOCs is a philanthropic one and for others a business proposition," and that "in both cases, there is the challenge of finding a viable model that allows for sustainability of MOOC provision. (p. 3)

The literature identifies two primary models of MOOC design: 1) a cMOOC based on connectivist principles and delivered via open and social means, and 2) an xMOOC of the type usually developed at universities, considered an eXtension of the university course, which therefore adheres to the dominant pedagogical approach (Yuan, Powell, & CETIS, 2013). However, it is important to note that theorists have begun the process of further identifying differences among MOOCs along with their purposes. For example, Curt Bonk (2012) provides a comprehensive list of Twenty Types, Targets, and Intents of

MOOCs. George Veletsianos (2012) identifies two overarching philanthropic purposes for MOOCs, 1) democratizing education and enhancing societal well-being, and 2) improving specific skills.

Bernard Nkuyubwatsi (2013), a MOOC learner and researcher from Rwanda, focuses on the role of MOOCs in democratizing education. First, he identifies MOOC constraints including low tutor (instructor) to student interaction (i.e. thousands of learners and one instructor), a "low level of Internet ubiquity and reliability," and interoperability issues. However, Nkuyubwatsi (2013) also sees MOOCs' potential for "improving the quality of access to higher education" through the affordances of openness, flexibility, and 24/7 access. Regarding the xMOOC, Nkuyubwatsi (2013) notes the empowering aspect of the model's "recruitment, delivery and assessment modes"; the maximal and meaningful interactions; and the contribution to "mitigating financial constraints and the shortage of higher education teachers" (p. 345). Of cMOOCs, he notes, "they can help academic and advanced students develop networks with their global counterparts" (p. 345). Nkuyubwatsi proposes that "academics and educational decision makers in Rwanda could themselves experience xMOOCs and through them, possibly create opportunities for learners who wish to study but are not served by the current higher education system" which thereby could "help in the development of a socio-economically inclusive higher education to transform the country into a knowledge-based society" (2013, p. 345).

I served as the designer, instructor, and faculty-researcher for the MOOC under qualitative investigation in this article. My goal was to develop an xMOOC with cMOOC principles to serve the purposes identified by Veletsianos and Nkuyubwatsi above:

- improving specific skills
- developing student networks
- democratizing education and enhancing societal well-being[1]

I write to share the first steps of my journey to identify a viable model that will enable the sustainability of MOOC provision. In the design process for the MOOC I discuss, I used the ADDIE model. As a result of the evaluation process, I propose the concept of "wrapping a course around a MOOC" (Bruff, Fisher, McEwen, & Smith, 2013) as one strategy to evolve a viable model worth further research.

[1] I placed these in the order (from least to greatest) of, what I believe to be, the importance and complexity of these purposes.

BACKGROUND

CONTEXT

I am an assistant professor of Curriculum and Instruction in the College of Education at New Mexico State University (NMSU). I teach online and blended courses for a graduate certificate program that I co-designed for online teaching and learning, as well as learning design and technology courses (LDT) for our masters and doctoral programs. I am a Quality Matters Peer Reviewer and two of my online courses are Quality Matters Recognized[2]. In 2013, based on several years of instructor-student interaction, I concluded that masters and doctoral students in our learning design and technology program were not conversant in the principles of systematic learning design. For example, they were unable to identify or discuss their own models for learning design and had never heard of ADDIE. Therefore, I redeveloped an existing course to fill that gap. In fall 2013, I provided the needed intervention by covering the basics of instructional design within an advanced curriculum design course, while retaining the usual concepts covered in that curriculum course. Ultimately, the concepts from this redeveloped advanced curriculum design course became the foundation for a faculty-designed MOOC. The MOOC was delivered alongside the fall 2014 version of the course. This was done to give the 19 graduate-level students[3] in the fall 2014 LDT class the opportunity to experience a MOOC as part of their studies. I took this approach based on the idea that a MOOC should be considered a form of advanced curriculum design.

Identical assignments were posted to the university online course environment to give students the choice to participate or not participate in the MOOC experience. All students chose to participate in the MOOC. Each student kept a portfolio of selected activities related to the MOOC to bring back and share within the university online course environment. Bruff et al. (2013) refer to this blended learning type of MOOC as "wrapping a course around a MOOC" or "wrapping a MOOC." Technically, this term has been used to refer to instances in which instructors use someone else's MOOC in their course. This article refers to the MOOC being discussed by the abbreviated title, "#LDTIMOLO."

[2] Quality Matters (QM) defines itself as an international organization whose "quality assurance processes have been developed to improve and certify the design of online and blended courses." (See http://www.qualitymatters.org)

[3] This course was taught hybrid and was cross-listed for masters and doctoral students. There were 19 total: six face-to-face doctoral students, three face-to-face masters students, and 10 online masters students (started with 11, one dropped).

PURPOSE

The first goal of this case study is to describe the experience of using ADDIE as a model for the design and evaluation of a MOOC delivered during fall semester 2014 as part of a course in Learning Design and Technologies (LDT) for graduate students at New Mexico State University (NMSU). The second goal is to investigate this same faculty-designed MOOC with a set of questions in mind. I was able to share the research potential for this MOOC with the graduate students who took the LDT course with MOOC. As budding learning designers and researchers, they helped me review the existing survey questions and develop the eight overarching thematic questions addressed in this study. Interested in the specific MOOC at hand, #LDTIMOLO, I focused on questions related to design, engagement, the impact on my graduate students, and how I could best move forward as a faculty member designing MOOCs. My graduate students were especially interested in what participants thought both about the purpose of a MOOC and about the role of the instructor/facilitator in a MOOC.

The section of the paper titled #LDTIMOLO AND ADDIE addresses the following questions:

1. How was ADDIE used in the design of #LDTIMOLO?
2. What does engagement look like in #LDTIMOLO?
3. What are the design lessons learned from evaluating #LDTIMOLO?

The DISCUSSION section addresses the following questions:

4. What is the purpose of a MOOC?
5. What are the reasons that participants took this MOOC (#LDTIMOLO)?
6. What is the role of a MOOC instructor/facilitator?
7. What is the impact of #LDTIMOLO on the participating graduate students?

The CONCLUSION section addresses the following question:

8. What is the best course of action for me moving forward with faculty-designed MOOCs?

DATA COLLECTION

For this study, I collected data via field notes, learning management system analytics, and surveys.

FIELD NOTES

I used Google Docs to keep field notes, including "#LDTIMOLO Field Notes" in the titles so that I could easily find them in the search process. The field notes that I used for this study include 1) my application of the ADDIE design process to create and modify #LDTIMOLO, 2) my weekly class conversations with my 19 graduate students[4], 3) the graduate student-created #LDTIMOLO portfolios and their graduate course final project artifacts, and 4) continued conversations that I participated in with these graduate students during the year following #LDTIMOLO. These field notes were used as needed to provide clarity and accuracy for this study.

LEARNING MANAGEMENT SYSTEM ANALYTICS

The learning management system (LMS), Canvas Learning Network, hosted #LDTIMOLO, and LMS analytics data was accessible for use to provide context discussed later in the IMPLEMENTATION section. This included information such as total number of students enrolled, number of active students, and number of discussion entries added. However, I did encounter discrepancies and ended up manually counting the discussion entries.

SURVEYS

Three surveys were used for this study. Canvas Learning Network designed and implemented two of the surveys using the built-in quiz feature. The first was a pre-course survey titled "Welcome to Canvas Learning Network Survey" that all #LDTIMOLO participants had to view to move forward but were not required to take. The second was a post-course survey titled "User Experience Survey," sent by Canvas Learning Network to all participants at the end of #LDTIMOLO, which was not a requirement. These surveys were adequate for general course/MOOC evaluation; however, I had some additional questions. I used Survey Monkey[5] to administer an additional optional post-course survey titled "End of #LDTIMOLO Survey." This survey was sent after the end of #LDTMOLO via the messaging system to all participants.

[4] We met as a class once per week. We had two class meetings prior to the start of the MOOC and discussed MOOCs and #LDTIMOLO including the research questions of this study. During the five-week MOOC implementation period, after Google Hangouts that were conducted during the class-meeting time frame, I met with the students who showed up on-site to formatively discuss MOOC progress. Post-MOOC, for an additional eight weeks, we continued our regularly scheduled weekly class meetings and our MOOC conversations continued.

[5] Survey Monkey is a formal survey tool with better analysis capability than an LMS course quiz tool. In the case of high participation, this would be a better survey tool option.

DESIGNING A MOOC (#LDTIMOLO)

"Why, sometimes I've believed as many as six impossible things before breakfast."
(Carroll, 1920)

The MOOC at the focus of this case study was titled "Adventures in Learning Design, Technology, and Innovation." The social media hashtag and shortened descriptor for the MOOC was #LDTIMOLO. "LDTI" served as the short form for "Learning Design, Technology and Innovation." For reasons described directly below, I avoided use of the acronym MOOC, instead coining the term, "MOLO" to stand for "Massive Online Learning Opportunity." Although #LDTIMOLO was potentially massive (with a cap of 2,500) and online, the first iteration of the course was located behind a password in a learning management system (LMS). #LDTIMOLO was hosted on the LMS being used by my NMSU graduate students. Access to #LDTIMOLO on the university LMS was provided to members of the public at no cost, yet given any barriers to access, such as enrollment and closed modules, I was unwilling to describe the learning opportunity as "Open." Additionally, #LDTIMOLO was not a full-blown "Course." Rather it was part of a course wherein I used the concept of "wrapping a course around a MOOC" or "wrapping a MOOC" (Bruff, et al., 2013). For all these reasons, I adopted use of the term "Learning Opportunity" and thus the acronym MOLO for the massive online learning opportunity I designed, delivered, and researched for this case study. Of note: The content of #LDTIMOLO, along with the full survey data summarized in this case study, are available at an open access, accompanying wiki reachable via https://ldtimolo.pbworks.com/.

#LDTIMOLO AND ADDIE

ADDIE is one of the most common instructional design (ID) models used and is considered a prescriptive instructional systems design (ISD) model. ADDIE is an acronym for the five elements or stages of analysis, design, development, implementation, and evaluation (Hodell, 2011). In this section, I draw upon the related literature and my field notes to address the first question of this study: How was ADDIE used in the design of #LDTIMOLO?

ANALYSIS

In the ADDIE model, analysis is the stage in which the instructional designer gathers all relevant and necessary data for the development of a learning intervention, including identification of content needed by the learners (Hodell, 2011). As noted above, by 2013 it became evident to me that masters and

doctoral students in our learning design and technology program were not conversant in the principles of systematic learning design. Thus, I redesigned a Learning Design and Technologies (LDT) graduate course I was slated to teach in fall 2013 to provide the needed learning intervention to address my graduate students' knowledge gaps. The concepts from this redesigned LDT course became the foundation for the MOLO that I delivered, a year later, in the fall of 2014, alongside that semester's version of the LDT course.

DESIGN

In the ADDIE model, design is the stage in which the instructional designer creates the blueprint, roadmap, or storyboard for the project including development of objectives, construction of basic course content, and the overall plan for the course design (Hodell, 2011). Though #LDTIMOLO was to be a professor-centric and therefore an xMOOC-like learning opportunity, I attempted to design and implement #LDTIMOLO from cMOOC, heutagogical, and connectivist perspectives.

Part of the content for this #LDTIMOLO was already developed, however. To adapt it to MOOC format, I attempted to understand, design, and develop it for learner engagement with both my local graduate class and a potential global audience. Heutagogical and connectivist principles emphasize learner engagement and address MOOC purposes previously identified by Veletsianos and Nkuyubwatsi regarding democratizing education and developing student networks. The following subsections include concepts that impacted design of #LDTIMOLO-taxonomies of learning engagement and methodological perspectives; and provide key course design outcomes: the final #LDTIMOLO catalogue description and the initial outline for the five modules.

Learner Engagement

A common concern related to MOOCs involves a low completion rate "which averages no more than 10%" (Breslow, Pritchard, DeBoer, Stump, Ho, & Seaton, 2013, p. 21). The majority of research conducted in relation to this MOOC retention issue and in the allied area of learner engagement focuses on participation models. Two prevalent taxonomies for participation are discussed in the literature. The first and most discussed taxonomy identifies four patterns of student behavior in MOOCs (Hill, 2013):

1. Lurkers (or Observers) are people who enroll in an open course but just observe or sample a few items at the most. These students form the majority of xMOOC participants. Many of these students do not even get beyond registering for the MOOC or maybe watching part of a video.

2. Drop-Ins are students who become partially or fully active participants for a select topic within the course, but do not attempt to complete the entire course. Some of these students are focused participants who use MOOCs informally to find content that help them meet course goals elsewhere.
3. Passive Participants are students who view a course as content to consume and expect to be taught. These students typically watch videos and perhaps take quizzes, but tend not to participate in activities or class discussions.
4. Active Participants are the students who fully intend to participate in the MOOC, including consuming content, taking quizzes and exams, taking part in activities such as writing assignments and peer grading, and actively participating in discussions via discussion forums, blogs, twitter, Google+, or other forms of social media.

The second taxonomy identifies five engagement styles (Sharma, Jermann, & Dillenbourg, n.d.):

1. Bystanders are students who register, but don't engage much. They may never log in at all, or they may poke around, but then disappear.
2. Collectors are students who mainly just download and watch the lectures, but don't really participate in the course.
3. Viewers are students who watch the lectures, and participate minimally in the course; they might contribute to discussions, but don't do many of the assignments.
4. Solvers do the assigned work, but don't necessarily watch the lectures.
5. All-Rounders achieve a balance of watching lectures and doing assignments.

Ideally, as a learning designer, I strive to create learning environments that promote learners taking on the roles of Active Participants and All-Rounders.

Methodological Perspectives

When designing learning environments, the designer must choose from among a variety of methodological perspectives. In the design of #LDTIMOLO, heutagogy and connectivism served as the methodological framework for creating a curriculum and learning environment that was intended to support optimal learner engagement. Heutagogy does not discount pedagogy or andragogy (Blaschke, 2012); rather, as "the study of self-determined learning, [it] may be viewed as a natural progression from earlier educational methodologies–in particular from capability development–and may well provide the optimal approach to learning in the twenty-first century" (Knowles, 1970, para 1). Though heutagogy is in the early stages of development, its significance lies in (a) its attempt to organize and "draw together" key ideas and approaches that

"address the changed world we live in," and (b) its "attempt to challenge some ideas about teaching and learning that still prevail in teacher-centered learning and the need for 'knowledge sharing' rather than 'knowledge hoarding'" (Hase & Kenyon, 2000, para. 5).

Conversations regarding methodology have been taking into consideration "the impact of technology and new sciences (chaos and networks) on learning" (Siemens, 2005, p. 5). Existing learning theories are valuable and not discounted but may be inadequate for teaching and learning in the modern world. Viewing established learning theories through technology, for example, raises many important questions. The natural attempt of theorists is to continue to revise and evolve theories as conditions change. At some point, however, the underlying conditions have altered so significantly that further modification is no longer sensible. An entirely new approach is needed (Siemens, 2005, p. 5).

Like heutagogy, connectivism (Siemens, 2005) is an attempt to challenge existing ideas about teaching and learning and address the complexities of technology and new ways of learning. Connectivism allows for a learning trajectory wherein diversity, connections and networks, artificial intelligence, and the Internet are valued as part of the learning process.

With concerns about learner engagement and retention and with the above pedagogical framework in mind, the final description and outline for #LDTIMOLO emerged as follows:

> Explore the exciting learning technology landscape that has been created by unlimited access to information, online tools perfect for collaboration, and the rapidly changing technology all around us.
>
> In this five-week adventure, we will use connectivist and heutagogical practices to explore 1) how to be a successful learner, 2) the best strategies for collaborative learning, 3) the basics of learning design aka instructional design, and 4) current innovative models for learning design.
>
> This course is perfect for both K-12 and higher ed instructors. Students will have the opportunity to learn from me and from each other through Google On Air Hangouts. In addition the course will rely heavily on course participants to contribute to the social learning environment.
>
> I hope that you will join me for this GREAT ADVENTURE!

The initial outline[6] included these five modules.

1. Module 1: Preparing for the Adventure. In Week 1, we will prepare for our learning adventure with a variety of activities including Create your Avatar/Superhero Introductions, Google Hangout, developing our personal learning environments and networks, and other engaging introductory activities.
2. Module 2: In Week 2, we will use a Google Hangout to discuss the week's topics, and we will practice group collaborative activities called Quests with a choice of digital literacy activities (Twitter Top 5, Memorable Memes Mania, Curation Nation, etc.)
3. Module 3: In Week 3, we will use a Google Hangout and other engaging collaboration-based activities to explore key concepts related to pedagogy, learning theory, and learning design with technology.
4. Module 4: In Week 4, we will use a Google Hangout and other engaging activities to explore innovative learning design with technology (models and strategies). Learners will choose Quests to learn about models including Online Models, Blended/Hybrid Models, Game-Based Learning and Gamification Models, and Critical Pedagogy and Technology (aka Hybrid Pedagogy) Models.
5. Module 5: In Week 5, we will use a Google Hangout and other engaging activities to bring it all together and reflect on learning and action plans to continue on the path of innovative learning design with technology.

DEVELOPMENT

In the ADDIE model, development is the stage where course materials are produced and pilot testing is recommended (Hodell, 2011). Miller (2015) identifies six best practices of online teaching and learning that I drew upon for developing #LDTIMOLO: 1) strong instructor presence, 2) creation of learning community, 3) construction of collaborative experiences, 4) invitation to reflect, 5) use of formative assessments, and 6) adding a synchronous element. Thus in this development stage, I worked to develop curriculum that included hands-on practice, experiential learning, and learner choice as primary strategies. Specific learner and learning-centered strategies used and modeled included technology-based projects; online discussions/conversations; and collaborative group work. Instructional methods included live/recorded meetings, facilitator-created video and audio resources, brief tutorials, collaborative knowledge building via sharing of learner-based research and learner-created materials, discussions/ conversations, reflection, and more.

[6] I say initial because later, during Implementation, I collapse modules 4 & 5.

In support of strong instructor presence and the creation of learning community, I developed an introduction discussion forum activity that included the creation and use of avatars and superhero identities. Additionally, in a previous online course that I taught, students provided feedback that we could increase their engagement by using a more authentic and active language to describe our activities. Specifically I referred to course "modules" as "adventures," and used the terms "debate" and "reflection" in place of the LMS term "discussion." I also thought of the engagement inspired by massive multiplayer role player games and wanted to tap into that type of language. Thus, for #LDTIMOLO, collaborative, technology-based activities were titled Quests, collaborative Google Doc worksheets were called questsheets, and teams were called guilds. I referred to the use of avatars and authentic curricular terminology as "gamification," the term I used in survey questions. As related to #LDTIMOLO terminology, this is indirectly supported by empirical research. Bedwell, Pavlas, Heyne, Lazzara, and Salas, (2012) created a taxonomy that linked game attributes to learning; their game attribute of "game fiction" was linked to "the nature of the game world and story" (p. 13). In a blog post, Richard Landers (2015) provided an example of gamification for teaching thus: "lectures, tests, and discussions are renamed adventures, monsters, and councils, respectively" (para. 11). Alternately, Deterding, Dixon, Khaled, and Nacke, (2011) note that "[g]iven the industry origins, charged connotations and debates about the practice and design of 'gamification,' 'gameful design' currently provides a new term with less baggage, and therefore a preferable term for academic discourse" (p. 14). Thus, excluding the related survey questions, the term "gameful design" is used hereafter.

IMPLEMENTATION

In the ADDIE model, implementation is the stage of course delivery (Hodell, 2011). #LDTIMOLO ran from September 2 - October 7, 2014. (The MOLO host site was opened one week prior and stayed open one week later). The graduate students had preparatory course work for two weeks prior to the implementation of #LDTIMOLO. Based on formative assessment (a discussion with the nine face-to-face graduate student participants who joined me on-site for the Adventure 2 Google Hangout), Adventure 2 was extended for an additional week. To keep within the five-week timeframe, the activities schedule for weeks/modules/Adventures 4 & 5 were collapsed. Adventure modules were not all released at once; they were released the day before the next module started. I did this for two reasons. First, I was trying to minimize confusion by keeping us all on track together. Second, I was hoping to address poor retention in MOOCs, and I thought this might keep people coming back for more. In retrospect, I would have done this differently and released them all at once.

The following participation data, derived from the learning management system analytics, the surveys, and my field notes, demonstrates learner activity from the implementation of #LDTIMOLO.

- There were 724 participants enrolled. Of these, 126 took the next step and completed the "Welcome to Canvas Learning Network Survey", which was required to view to move forward and participate in the course, but participants were not required to take it.
- There were 19 discussion opportunities provided with 416 discussion posts created (my posts included):
    - During Week 1, the "FAQs and Help Forum" had 22.
    - In Week 1, Adventure 1, there were three discussion forums available. Introductions and Sharing Your Avatar or Superhero Identity had a total of 183 posts (this was the most active discussion); Set Up for Success had 26 posts; Increasing Opportunities for Success had 29 posts.
    - In Weeks 2 and 3, Adventure 2, there were four (4) discussion forums available. Strategies for Guilds and Quests had 28 posts; Complete a Guilds and Quests Agreement had 26 posts; Choose, Complete, and Share Your Quests had 13 posts; and Adventure 2 Reflection had 19 posts.
    - In Week 4, Adventure 3, there were four (4) discussion forums available. The Basic Rules of the Game had one (1) post; Set Up Guilds for Adventure 4 had zero (0) posts; What does a Learning Designer aka Instructional Designer Do? had 35 posts; and Adventure 3 Reflection" had ten (10) posts.
    - In Week 5, Adventure 4, there were seven (7) discussion forums[7] available. There were five (5) where learners would choose one to focus on: Online Models had zero (0) posts, Game-Based Learning and Gamification had Models had three (3) posts, Critical Pedagogy and Technology zero (0) posts, and Experiential Learning had two (2) posts. LDTI Mashup Machine had six (6) posts; and the Reflection of Our Awesome Adventures had ten (10) posts.

There were five (5) recorded Google Hangouts. Google Hangouts is a free web conferencing technology that can be complicated for learners to use. Although the number of live viewers was not recorded, Google viewing data suggest a

[7] As a reminder, Adventure 4 included both Adventures 4 & 5 due to the need to devote additional time to complete Adventure 2.

significant drop-off of participation in the Hangout over time. Specifically, Google views indicated that the first Hangout drew 197 views, the second drew 105 views, the third drew 36, the fourth drew 24, and the fifth drew 38 views.

EVALUATION

In the ADDIE model, evaluation is listed at the end, but Hodell (2011) recommends that it be used formatively (throughout) and summatively (at the end) during implementation and that the entire process be embedded in evaluation. The LMS analytics data, the surveys, and my field notes provided evaluation data for formative, summative, and design information and guidance for the #LDTIMOLO. The following is a snapshot of the survey participation data for #LDTIMOLO.

- Of the 724 enrollees, 126 took the next step and completed the "Welcome to Canvas Learning Network Survey"; viewing it was required to move forward, but participants were not required to take it.
- 24 participants took the Canvas Learning Network "Exit User Experience Survey" that was sent to all participants at the end via the messaging system.
- 25 participants took my "End of #LDTIMOLO Survey" that I sent after #LDTIMOLO ended.
- There was an exit evaluation provided in the quiz tool at the end of Adventure 1 with 53 completions and at the end of Adventure 2 with 22 completions.
- As previously noted, 20 graduate students participated in the #LDTIMOLO, each of whom may or may not have taken the surveys.
- One participant from a local community college used #LDTIMOLO participation as part of her promotion and tenure folder. She kept and completed a portfolio and I provided a memo of completion via regular email for her evaluator.

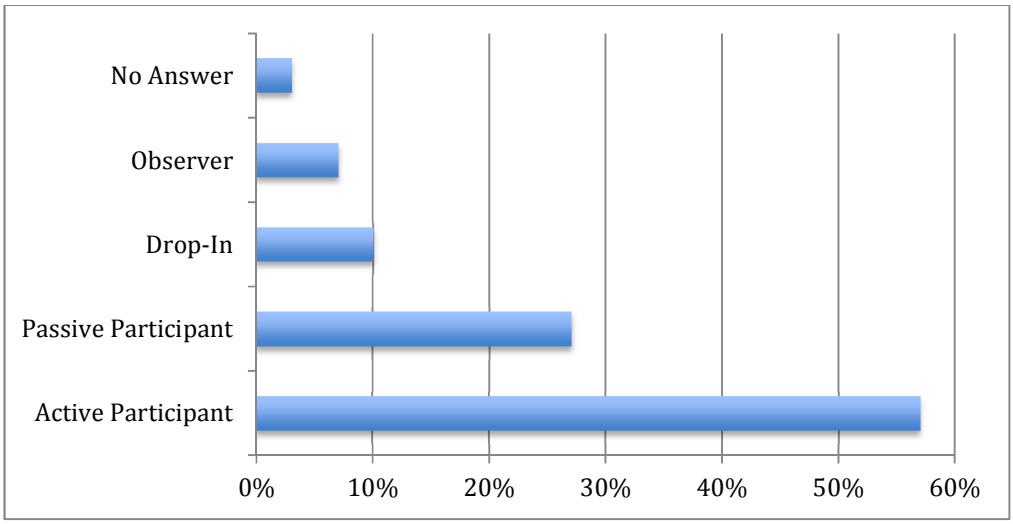
The following 12 data sets from the surveys address the following questions in this study: 1) What does engagement look like in this MOOC? and 2) What are the design lessons learned from evaluating this MOOC (#LDTIMOLO)? Design lessons are summarized immediately following these data sets.

What does engagement look like in this MOOC?

Data sets 1-4 are from the pre-course survey, "Welcome to Canvas Learning Network Survey," and my post-course survey, "End of #LDTIMOLO Survey," and focus on the MOOC Participation Model taxonomies. Data sets 5-8 are from the two post-course surveys and focus on questions of engagement.

Data Set 1.

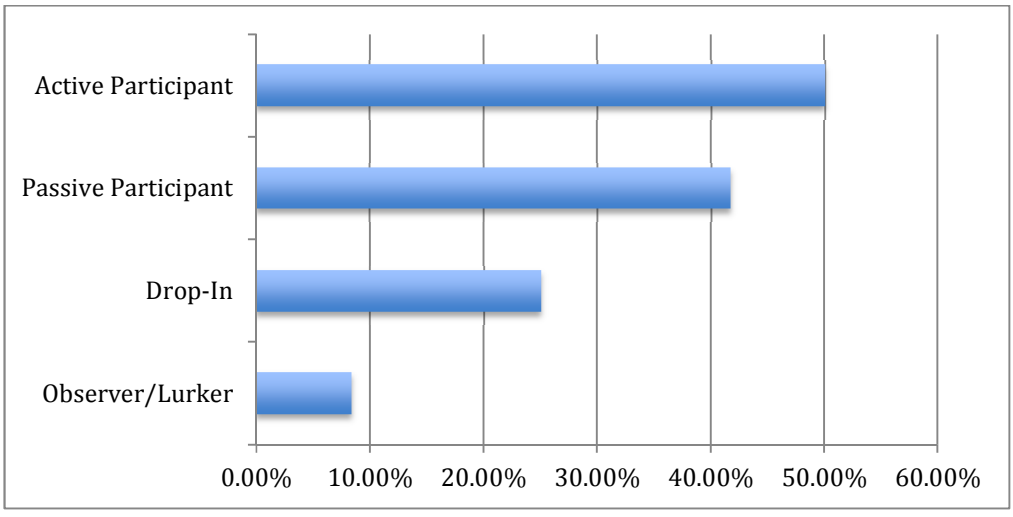
In the Canvas Learning Network Welcome Survey, 122/124 participants responded to the question, "Which type of online learner describes you?"



Data Set 2.

In the Survey Monkey End of #LDTIMOLO Survey, 25 participants responded to the question, "Based on this Participation Model, what type of participation did you engage in with this MOOC? Pick all that apply."

It is worth noting that the percentages for perceived engagement are very similar to the percentages in the pre-assessment question graphed directly above.

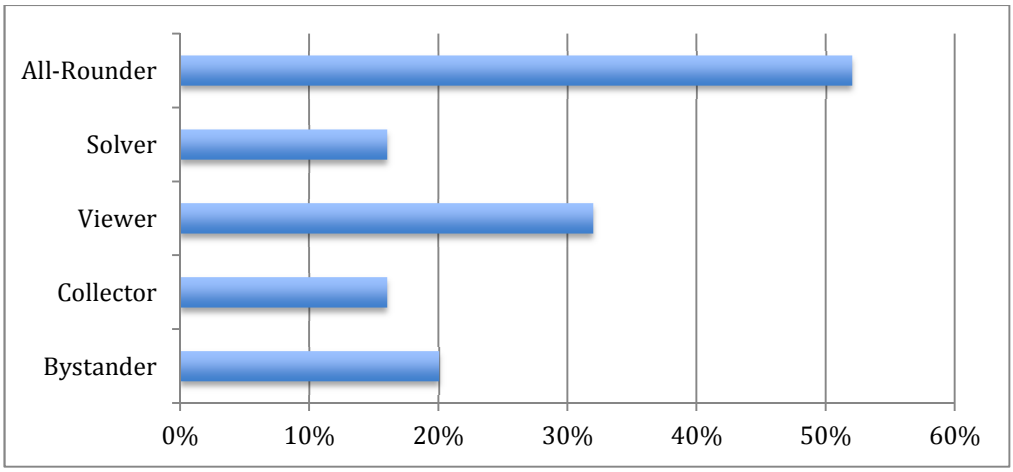


Students had the opportunity to comment:

- I always have hope I will be a stronger participant, but work comes first.
- I really like the idea of Active Participant; however, there are some tasks that I would select instead of using all of them. For instance, peer grading. If the instructor provides an orientation of guidelines (or even develop that with the participants), I think it can be a powerful learning experience. The thing is that some instructors (not saying my current MOOC instructor), even in regular face-to-face courses assume that peers know how to provide constructive feedback. Then, if not all students are aware of how to provide feedback, there will be an imbalance in rewarding from the peer feedback experience. On the other hand, peer grading / feedback / review can be time consuming, since we need to fulfill the requirements of all activities and on top of that, we also need to spend time going through our peer's work. In the case of MOOC, it's a whole course involved, not only one activity, so peer grading is something to be negotiated within the amount of activities we already have throughout the MOOC.
- Again I felt that there should be another option here. I participated in about 75% of the course but didn't really finish the last activity.

Data Set 3.

In the Survey Monkey End of #LDTIMOLO Survey, 25 participants responded to the question, "MOOCs have participants who engage in varying types of participation. Based on this Participation Model, what type of participation did you engage in with this MOOC? Pick all that apply."



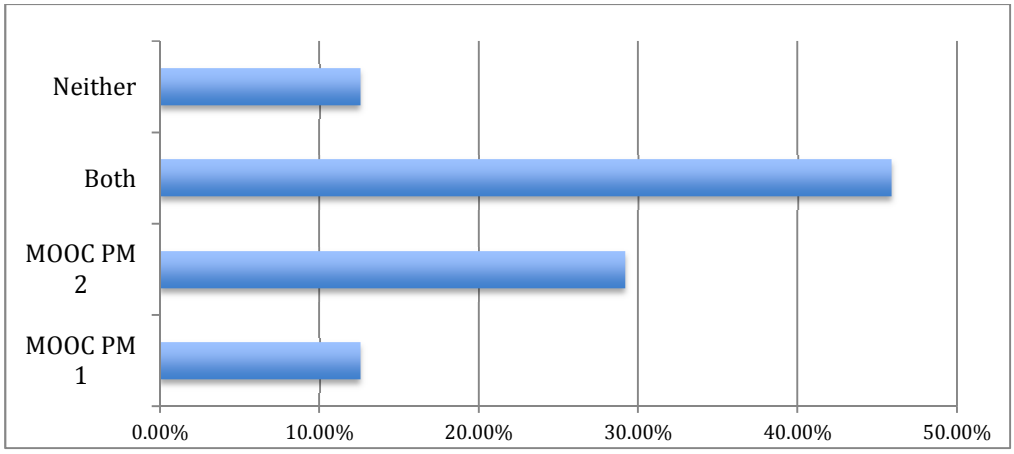
Students had the opportunity to comment:

- I always have hope I will be a stronger participant, but work comes first.[8]
- The thing on MOOC is that somehow I travel through all types of participants since we have this flexibility. But this is a personal matter of organization and priorities. My goal is for an eventual online course such as this one, accomplish the weekly assignments within the week assigned.
- Leader (initiating work for group activities)
- Although my original intention was to be an "All-Rounder," the technology was too intimidating so I backed off to the "Viewer" participation point. I am continuing to "play" with the tools introduced in the course, but on my own. If offered again, I hope to bring more confidence with some of the tools so I can increase my participation level.
- There isn't a role here about doing some of the assignments/activities, so I pick two that I would have been in between.

Data Set 4.

In the Survey Monkey End of #LDTIMOLO Survey, 24 participants responded to the question, "Which MOOC Participation Model do you prefer?" For this question, participants were provided these Participation Models:

- MOOC Participation Model (PM) 1: (All-Rounder, Solver, Viewer, Collector, Bystander)
- MOOC Participation Model (PM) 2: (Active, Passive, Drop-In, Observer/Lurker)



[8] Note: One survey respondent repeated here, verbatim, the same statement the individual provided as an open comment reported upon above in the section titled "Data Set 2."

It is worth noting that, although participants were being asked to pick a preference, they continued to focus on their own participation when asked to comment. Also, the majority chose "Both" as a preference. Perhaps they were interested in learning about the different models.

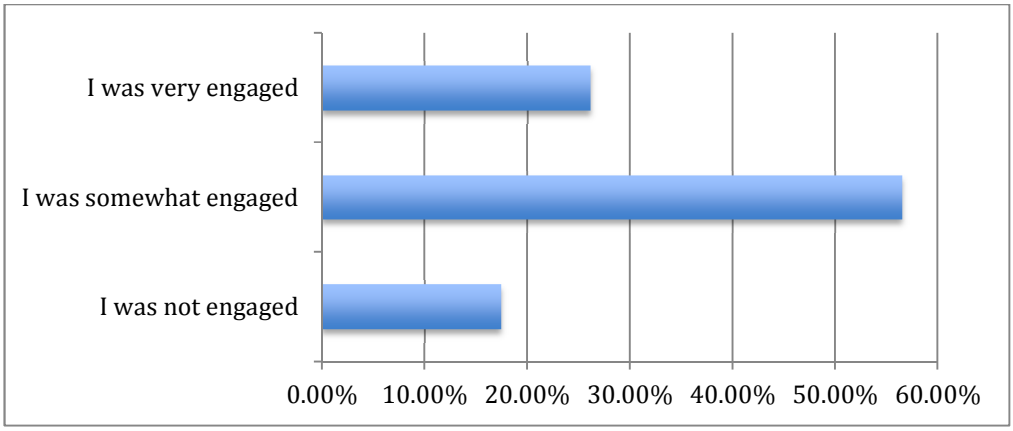
Data Set 5.

In the Survey Monkey End of #LDTIMOLO Survey, 10 participants responded to the open question, "If you were someone who entered the course, then left and never came back, why did you leave?" The following comments can be summarized as addressing time constraints, navigation issues, curriculum issues, and lack of accountability.

- Time consuming and constraints.
- I had no time.
- Structure was confusing /hard to follow / lack of group participation
- Too much work.
- I would leave for lack of time to develop all the resources we have available online. Every tool is new for me and it takes time to figure out how to use those online devices. I didn't feel that my peers want to take time to teach me something, but I took time to teach them since I am used to the teaching assistance. Yet, I also want to say that the reasons my peers were not very receptive to my wish to collaborate. They may also be in learning themselves how to use the devices and expect that somebody else will tell them how to go through each step. When, in truth, I perceived the MOOC structured for us to assist each other unconditionally. MOOC is also an amazing source of information, but it is valid if one's track focus on technology, which is not my case. But it was still a valid experience since I got to know a different world (and I love it).
- Because it is not what I was looking for, because I didn't have enough time to follow it or because is difficult to follow.
- Lack of time and lack of participation.
- I stayed until the last session!
- Course content curated but not edited for focused study.
- I was very interested in the MOOC and its topic and the instructor. I also really wanted to experience my first MOOC. However, aside from the first week when I was at least able to dig around a bit, I never seemed to find the time to participate and not having to be accountable for attending or not, I found myself doing what I felt were higher priority items over participating in MOOC activities.

Data Set 6.

In the Survey Monkey End of #LDTIMOLO Survey, 23 participants responded to the question, "This MOOC was specifically designed to promote learner engagement. How engaged were you in this MOOC?"

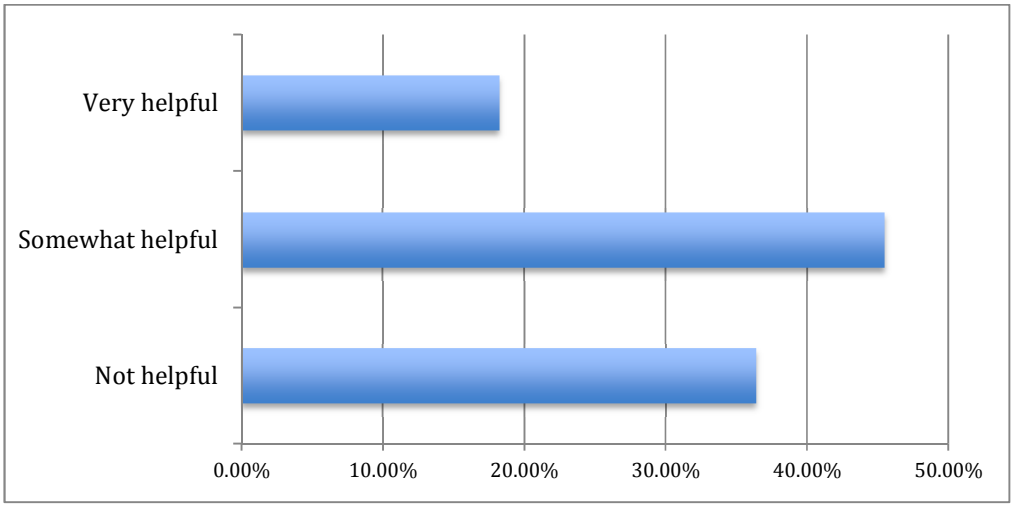


Students had the opportunity to comment:

- The e-mail that came via Canvas gave me a sense of being connected, but sadly I rarely got beyond that.
- The timing of our online meetings were mainly the reason I was only somewhat engaged.
- It was a new experience but an exciting one.
- Because there is no formal certificate and because many learners are dealing with competing priorities for their "time", I think many people drop from a MOOC if there is no "What's in it for me?" (WIFM). I was tempted to drop out when things got busy in my work and home life, but I feel that being in a small guild helped me persist. Some type of extrinsic reward (certificate, etc.) I think would also help with learner engagement.
- I experienced challenges with trying out some of the tools at which time my participation waned. Subsequently, I have been playing with the tools on my own so I can retake the course with more technical confidence.

Data Set 7.

In the Survey Monkey End of #LDTIMOLO Survey, 22 participants responded to the question, "This MOOC made a limited attempt at gamification with the language used for learning. For example, Adventure instead of Module, Quest and Questsheet instead of Activity and Worksheet, etc. Was this helpful?"

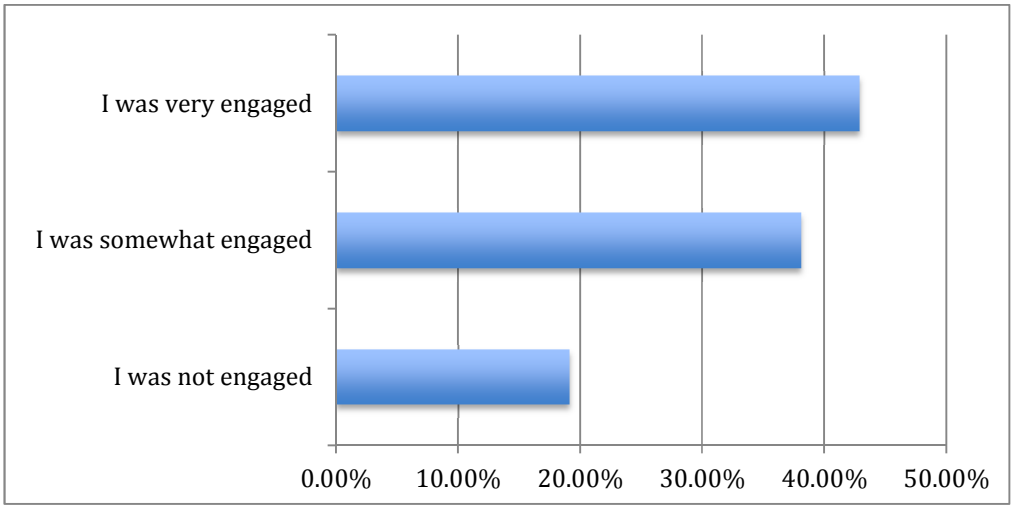


Students had the opportunity to comment:

- Really did not like it. Gamification isn't about just using terminology, it's about creating a gaming experience.
- It was helpful in a sense that we started using the terms in this field. I think this is one of the challenges: we had to learn a new language.
- I understand why this would be helpful. I'm just not sure it is necessary for graduate students.
- I was not familiar with gamification and was just confusing.
- Sometimes slanting the language to make the experience more fun can be helpful and more inviting. Not as stuffy and sterile as terms like "Module" and "Worksheet."
- Initially not helpful because I was already new to the gamification language. Now that I am adopting this new language, I can appreciate the creativity of the use of "Adventure" and "Quest" more.
- If I wanted to play a game, I wouldn't participate in a MOOC.

Data Set 8.

In the Survey Monkey End of #LDTIMOLO Survey, 21 participants responded to the question, "In this MOOC, the introduction activity was gamified with avatar creation and superhero perspective. Did this engage you?"



Students had the opportunity to comment:

The creation of the avatar had no connection to anything else.

- I did it, but I still didn't get the meaning of that.
- It showed us a way to engage our future students and broadened my horizon on apps that could be helpful.
- I loved this activity, help me to create my avatar and think about my online identity.
- Yes, this was good just to experiment with technology in a safe environment. I work in higher ed and feel that creating superheros wouldn't be well received, though, in for-credit classrooms.
- Too much, too soon for this rookie. It took me too long to figure out how to find and add an avatar. A quick instructional video would have been helpful but I appreciate that I could have sought out the same on my own as well. I simply decided not to spend the time on that task as it was not a priority for me at the time.
- More like roleplay where you assume another identity. Much like the early days of the internet.

What are the design lessons learned from evaluating this MOOC (#LDTIMOLO)?

The following data sets, 9-12 provide specific information for improvement in MOOC/MOLO design.

Data Set 9.

In the Survey Monkey End of #LDTIMOLO Survey, participants were asked the open-ended question, "What concepts addressed in this MOOC will you take with you?"

- The regular contact by the instructor was impressive to me.
- I'm only sorry I could not reciprocate.
- Educational tools
- I learned some new tools!
- That group work is very difficult especially if the people are not interested and just on lookers.
- Flexible learning!
- More than concepts I learn a lot about the use of technology in education, and I get new skills about to greate presentations, infographs, videos, comics, etc., also I discovered many web pages about education that I will certanly use [sic]
- Engagement with online as well as face to face students was interesting.
- You could watch the video any time and you do not miss the class announcement.
- Learner-focused educational model
- Introductions, Avatars, use guild for adventures, etc.
- The concept of giving student "choice" in assessments was great.
- Collaboration rules and ideas for virtual teams
- Infographics

Data Set 10.

In the Survey Monkey End of #LDTIMOLO Survey, participants were asked the open-ended question, "What have you liked most about this MOOC?"

- Meeting new people around the world learning new tools in networking
- The experience ... Just being part of it.
- The resources provided by the instructor and the way she structured it.
- Google Docs
- I did not like the Mooc
- Interaction!

- Learn about the subject
- Online class participation
- Vital teacher presence
- Be part of a big participation course.
- Exploring new cloud learning technologies and connecting with peers in higher ed
- Energy and encouragement to try out the myriad of tools available for teaching
- The course was well put together... I just felt it was too much info for 5 weeks.
- Aspirations of instructor to pull off something extremely intense and complex with multiple communication channels.
- I thought the instructor was very engaging, and I liked that she used several forums to contact the students.

Data Set 11.

In the Survey Monkey End of #LDTIMOLO Survey, participants were asked the open-ended question, "What have you liked least about this MOOC?"

- It was frustrating to have to access multiple places to complete work.
- The peer collaboration. It's gambling. We never know who we are going to interact to. We all have different backgrounds and agenda, so it would be interesting that we all have the conscious to take advantage of the differences.
- I had a hard time with all the different modes of communication. Great access, but I would've liked to have it more focused on one or a couple.
- All of it
- Nothing!
- The format
- N/A (not applicable)
- So open-ended that there was no core
- It was confusing at the beginning but was excited at the end.
- Seeing students drop out
- Nothing
- Too many group projects... I was burned out by the end of the 3rd adventure...
- Complexity and confusion that resulted from gamification and multiple communication channels.

Data Set 12.

In the Survey Monkey End of #LDTIMOLO Survey participants were asked the open-ended question, "What are your recommendations and suggestions for changes that would be helpful for the next version of this MOOC?"

- More explanations for the group working
- A simpler format.
- To put more emphasis on the importance of honesty while collaborating among peers. However, it's hard to deal with that in a MOOC since the amount of people can be huge to moderate it.
- Some consistency as to where we find certain things as far as communicating.
- Better organized and be straightforward with what is needed to be done.
- It was good!
- Evaluate the way the information is presenting, identify better objectives and paths, enlight specific concepts
- N/A (not applicable)
- It is my first one and I can not give any suggestion.
- I would have used the "calendar" tool in Canvas to keep the large course on task. A few times I was confused when I should get things done. I realize there were some general date ranges for the Adventures on the main page (next to each module/adventure title), but I ended up creating a calendar for our small private guild to keep us on track. It would have been nice to have everything due in the MOLO on a Course Calendar too.
- None at this time
- Perhaps if the course was spread out and each adventure had two weeks for collaboration.
- Provide visual graphic representing paths through the learning process.

MOOC/MOLO DESIGN LESSONS

With the ADDIE model, as with most instructional/learning design models, it is important to use evaluation data to revise, re-envision, and reconsider what happens next. From the 12 survey data sets previously shared and my field notes related to weekly class conversations with my 19 graduate students, the following design lessons for this MOOC have emerged:

- First, it must be clear what the purpose for the MOLO is. For example, this #LDTIMOLO was designed to serve two audiences, the LDT graduate class and potential global learners. From the graduate class perspective, described below, the #LDTIMOLO was successful. From a global learner perspective, using completion rate as a metric, the #LDTIMOLO was not a success.
- In traditional online courses, it is important to level the playing field and scaffold learners into the skills and content of the course. A MOOC/MOLO might not be the place for this. Two conclusions can be considered: 1) create a MOLO just for these beginning skills, and 2) make it very clear for whom the content is intended and be explicit about the skill levels are required. Additionally, using the previously discussed concept of "wrapping a course around a MOOC," which is how I intend to continue to engage with MOOC/MOLO design, the university course could be used to scaffold learner skills prior to MOLO engagement.
- The pedagogical perspectives used to design #LDTIMOLO have been successful as part of my own regular online course design. They did not translate as well for #LDTIMOLO design. There was too much content, too many goals, and too much curricular activity going on in terms of learning objectives. In retrospect, I also realize that I over-built the course in relation to the role of MOOC instructor/facilitator, as I discuss later. In the future, design needs to be more focused, specific, and discrete. I learned a lot from what participants did and did not do and from all of the evaluation data.
- The graduate students recommended creating a MOLO for each of the Adventures.
- Gameful design with the use of avatars and changes in terminology had mixed responses.
    - The Introductions and Sharing Your Avatar or Superhero Identity had mixed responses but was the most successful activity. I will use this activity or a modified version of this activity in future classes and MOLOs.
    - Gameful design of curricular vocabulary had mixed responses. I will reconsider this in light of related MOLO content. Changing the vocabulary for group work was mostly just confusing to participants, especially the ones already struggling with English.
- Current LMSs are not conducive to massive collaborative group projects as I design them. Collaborative group projects will not be a part of my design for the next MOLO. A MOLO just about collaboration is possible but collaboration, as part of the MOLO learning design, still needs work.

DISCUSSION

This discussion section addresses the following questions:

4. What is the purpose of a MOOC?
5. What are the reasons that participants took #LDTIMOLO?
6. What is the role of a MOOC instructor/facilitator?
7. What is the impact of #LDTIMOLO on the participating graduate students?

WHAT IS THE PURPOSE OF A MOOC?

As part of this study, participants who completed the MOOC were asked to share, in their own words, what they thought the purpose of a MOOC should be. This was a general question developed by my graduate students. The response size of 16 is not statistically significant and thus the data are not fully generalizable; however, there were enough responses to identify three potential overarching perceptions of the purposes for MOOCs: 1) to learn, 2) to interact, share, and develop networks, and 3) to engage with the potential of the online experience. Of note, these participant-identified purposes share characteristics and align with the purposes identified by Veletsianos and Nkuyubwatsi as improving specific student skills; developing student networks; and democratizing education and enhancing societal well-being.

WHAT ARE THE REASONS THAT PARTICIPANTS TOOK THIS MOOC (#LDTIMOLO)?

As part of this study, MOOC participants were asked at the end why they enrolled. Fourteen reasons for enrollment were provided for participants to choose from and all were chosen as applicable to some extent. Highest rated were 1) general interest in topic, 2) for personal growth and enrichment, 3) for fun and challenge, and 4) to experience an online course (MOOC).

WHAT IS THE ROLE OF A MOOC INSTRUCTOR/FACILITATOR?

As part of this study, MOOC participants were asked to share in their own words what they thought the role of the MOOC instructor/facilitator should be. This was a general question posed by my graduate students. Again, though a minor response of 19, and not generalizable, there were some themes that arose: 1) traditional role, the same as in a regular classroom, 2) role of instructional or learning designer, 3) one who guides, supports, and facilitates, 4) promoter of life-long learners, responsible learners, and critical thinkers, and 5) human evolution.

There was only one person who noted "human evolution" and it is uncertain if this is a serious response, but these two questions and response

themes illustrate that with a world of potential MOOC participants, there are a multitude of reasons, purposes, and expectations of MOOCs and MOOC instructors. It should be noted that it might be difficult to engage in successful instructional design when the audience has such variation. From my perspective, the idea of doing a MOOC with a global audience was so daunting that I continually second-guessed myself and kept adding content to address my concerns. As noted in the previous design lessons, I over-built #LDTIMOLO.

In addition, when thinking about the role of instructor/facilitator it is interesting to consider Sebastion Thrun's expectations when he left Stanford and started Udacity. When Thrun was at Stanford delivering one of the most memorable and popular xMOOCs, the *Artificial Intelligence* MOOC, alongside his Stanford class, MOOC learners were taking an already popular Stanford course with a renowned Stanford professor. This is a very different perspective from learners taking an artificial intelligence MOOC created and delivered by Thrun's company Udacity or a learning design and technology MOOC by relatively unknown faculty. This is something to think about when considering the reasons that inspire people to take a MOOC.

WHAT IS THE IMPACT OF THIS #LDTIMOLO ON THE PARTICIPATING GRADUATE STUDENTS

As previously noted, I consider this iteration of the #LDTIMOLO to be unsuccessful as a MOOC. However, the impact of learning about MOOCs and participating in a MOOC on the participating graduate students has been of increasing interest to me. In noticing that some students had seemingly gone beyond my expectations in ways I had previously not seen, I caught incredible glimpses of student embodiment of democratizing education, a key purpose of MOOCs previously identified.

I have been teaching a variant of the advanced curriculum design course that I used to wrap around #LDTIMOLO at least once per year for five years, and I have always required my graduate students to complete final projects related to their own needs as educators. The majority of final projects have traditionally included the creation of websites for personal use or for curation of thematic content, and the creation of classroom learning plans from a learning design and technology perspective. On rare occasion, a couple of students have engaged in online or blended course design.

Upon completion of the 5-week #LDTIMOLO that involved "wrapping a course around a MOOC," the 19 graduate students returned to regular class participation. As part of their continued class experience, they completed final projects related to their own needs as learners and educators. From the course discussions and my field notes, I compiled the graduate students' final projects

and some of my thoughts about those projects. In addition, I related these projects and my thoughts to the three purposes of MOOCs previously discussed (abbreviations provided for brevity): P1) improve specific student skills, P2) develop student networks, and P3) democratize education and enhance societal well-being. And finally, I provided a follow up discussion about those glimpses of student embodiment of democratizing education that I referred to earlier.

1. Two students shared their personal learning networks including development of LinkedIn profiles. This was a new use for the final project but was not a new project for my students to complete. These final projects evidenced P1 and P2.
2. Three students created classroom websites that were similar to previous final projects and evidenced P1.
3. Six students created personal websites that were similar to previous final projects, which evidenced P1. Additionally, two of these students shared that they would continue with thematic websites for educators in their fields. This provided conceptual evidence of students understanding that they can participate as designers of P3.
4. Three students created thematic websites (one with content for educators and two were specifically in support of teaching English to their own populations). Two were similar to previous final projects and evidenced P1 and P3. Additionally, one was extraordinary and there was evidence that he participated as designer for P1, P2, and P3.
5. Three students participated in online course design. These were similar to other final projects and evidenced P1 and designing for P3. However, these students expanded their projects further than any previous students: One student applied ADDIE as she designed her first online course, one student revised her online course using the Quality Matters rubric, and one student created an online course for a MOOC provider, Udemy.
6. One student completed an activity plan to be completed by a district-wide Professional Learning Community (PLC). This project was very different and evidenced P1, a modified P2 (developing teacher/professional networks), and perhaps a modified P3 (democratizing professional development).

Seven of the 19 graduate students were international students, four of whom embodied democratizing education. One of the students from Saudi Arabia, who created a personal website, shared during a face-to-face class conversation that an additional goal for him was to create a site with resources about autism for his population, as they have very limited resources in this field. One student, literally the only student at our university from his country, shared during a face-to-face class conversation that the Internet access in his country is inaccessible and that

his hopes were that when it becomes more available, he wants to be ready for his people with resources for teaching and learning English. This student has made incredible progress, coming from a country where he had no access to the Internet to recently being hired as a K12 technology coordinator. Another student from China shared his project in class for teaching English via his website of integrated and interactive resources. This was not something I had seen a student do before and the actual engagement between the student and his audience provided evidence that this student was, himself, designing for P1, P2, and P3. His site includes a qq chat room (the most popular instant messaging tool in China) , a Weibo (Chinese Twitter) that has almost 20,000 fans, and an ESL Podcast channel with almost 20,000 subscribers. He is currently creating online courses in China and has aspirations of creating a MOOC. Finally, one of the students from Saudi Arabia, who revised her course using the Quality Matters rubric, shared in a conversation the following semester that she had been considering researching English Language Learners in a MOOC. This was interesting because she was initially uncertain about participating in #LDTIMOLO.

CONCLUSION

"If we profs can be replaced by a computer screen, we should be."
(Davidson, C., 2013)

MOOCs are both a) online courses and b) not online courses. They are online courses because for the most part, that is how they are currently being designed. They are not online courses because of the "massive" and "open" characteristics of MOOCs. I believe that we have successful strategies for designing traditional online courses involving methodological practices, but when the characteristics of "massiveness" and "openness" are added to courses implemented in learning management systems not designed to support massive collaborative group work, I struggled. Moreover, when the open nature of MOOCs engages learners with a multitude of reasons for participation, expectations, and levels of effort and capacity to participate, I did not find it practical to design for collaborative group work. I suspect I'm not alone in this regard.

In part because there are challenging methodological and design issues with which we must contend, MOOCs have sparked interest and debate, but they have shown promise to expand learning opportunities and therefore deserve continued research. However, if institutions of higher education are going to explore the full potential of MOOCs to improve specific student skills; develop student networks; and democratize education and enhance societal well-being, faculty members need richer support programs and access to more resources and

design strategies to participate successfully in MOOC development and delivery. We also need design process transparency and models that can be replicated.

The priority for this article has been to demonstrate my use of the ADDIE framework of instructional design to develop the MOOC titled "Adventures in Learning Design, Technology, and Innovation" (#LDTIMOLO). I developed #LDTIMOLO based on heutagogical and connectivist principles and chose evaluation methods that emphasize measures of learner engagement, including completion rate. Of note, if MOOC completion rate is the metric for success, this first MOOC/MOLO iteration cannot be deemed successful. However, I conclude that, as a wrap-around MOOC experience for graduate students in my LDT course, #LDTIMOLO had a decidedly obvious and positive impact, and especially so for some of my international graduate students. Based on the experiences shared in this article, and in anticipation of support from a student of mine who wants to continue researching MOOC concepts, I am planning a part two of #LDTIMOLO. I intend to continue with the model of "wrapping a course around a MOOC" (Bruff, Fisher, McEwen, & Smith 2013). I provide this statement as my answer to the final question left to answer in this case study: "What is the best course of action for me to continue with faculty-designed MOOCs?"

MOOCs probably won't be the earth-shattering game changers they were once prophesied to be, but they bring a sense of challenge and intrigue into higher education, an arena that needs to re-envision its role in the world. It is important for faculty members to take on challenges, to seek to design learning opportunities that will intrigue and engage learners, no matter how imperfect, chaotic, and out on a limb the circumstance of learning might seem. Perhaps that's how we do avoid being replaced by computer screens.

REFERENCES

Bedwell, W. L., Pavlas, D., Heyne, K., Lazzara, E. H., & Salas, E. (2012). Toward a taxonomy linking game attributes to learning an empirical study. *Simulation & Gaming*, 43(6), 729-760.

Blaschke, L. M. (2012). Heutagogy and Lifelong Learning: A Review of Heutagogical Practice and Self-Determined Learning. *International Review of Research in Open & Distance Learning, 13(1).*

Bonk, C. (2012, June, 16). Twenty Thoughts on the Types, Targets, and Intents of MOOCs [Web log post]. Retrieved February 12, 2015 from http://travelinedman.blogspot.com/2012/06/twenty-thoughts-on-types-targets-and.html

Breslow, L., Pritchard, D. E., DeBoer, J., Stump, G. S., Ho, A. D., & Seaton, D. T. (2013). Studying learning in the worldwide classroom: Research into edx's first mooc. *Research & Practice in Assessment, 8, 13-25.* Retrieved July 15, 2015 from http://jolt.merlot.org/vol9no2/bruff_0613.htm

Bruff, D. O., Fisher, D. H., McEwen, K. E., & Smith, B. E. (2013). Wrapping a MOOC: Student perceptions of an experiment in blended learning. *MERLOT Journal of Online Learning and Teaching, 9*(2), 187-199.

Carroll, L. (1920). Alice's adventures in wonderland. New York: Macmillan.

Chafkin, M. (2013). Udacity's Sebastian Thrun, godfather of free online education, changes course. *Fast Company, 14*.

Davidson, C. (2013, January, 13). If we profs don't reform higher ed, we'll be reformed (and we won't like it) [Web log post]. Retrieved July 15, 2015 from https://www.hastac.org/blogs/cathy-davidson/2013/01/13/if-we-profs-dont-reform-higher-ed-well-be-re-formed-and-we-wont-it

Deterding, S., Dixon, D., Khaled, R., & Nacke, L. (2011, September). From game design elements to gamefulness: defining gamification. In *Proceedings of the 15th international academic MindTrek conference: Envisioning future media environments* (pp. 9-15). ACM.

Hase, S., & Kenyon, C. (2000). From andragogy to heutagogy. *Ultibase Articles, 5(3), 1-10.* http://www.psy.gla.ac.uk/~steve/pr/Heutagogy.html

Hill, P. (2013, March, 6). Emerging student patterns in MOOCs: A graphical view [Web log post]. Retrieved July 15, 2015 from http://mfeldstein.com/emerging_student_patterns_in_moocs_graphical_view/

Hodell, C. (2011). *ISD from the ground up: A no-nonsense approach to instructional design*. American Society for Training and Development.

Hase, S., & Kenyon, C. (2000). From andragogy to heutagogy. *Ultibase Articles*, 5(3), 1-10.

Landers, R. (January 28, 2015). How to gamify your teaching: The processes of gamification [Web log post]. Retrieved March 15, 2016 from http://neoacademic.com/2015/01/28/gamify-teaching-processes-gamification/

Miller, S. L. (2015). Teaching an Online Pedagogy MOOC. *Journal of Online Learning & Teaching*, 11(1).

Nkuyubwatsi, B. (2013). Evaluation of Massive Open Online Courses (MOOCs) from the learner's perspective. *The 12th European Conference on e-Learning ECEL-2013, 30-31 October 2013, Sophie Antipolis, France.*

Sharma, K., Jermann, P., & Dillenbourg, P. Identifying Styles and Paths toward Success in MOOCs.

Siemens, G. (2005). Connectivism: A learning theory for the digital age. *International journal of instructional technology and distance learning, 2(1), 3-10.*

Sokolik, M. & Zemach, D. (2014). How to be a successful MOOC Student. Wayzgoose Press. [Kindle edition]. Retrieved from Amazon.com

Veletsianos, G. (2012, July, 11). The purpose of a MOOC? Google and societal well-being [Web log post]. Retrieved April 15, 2015 from http://www.veletsianos.com/2012/07/11/the-purpose-of-a-mooc-google-and-societal-well-being/

Yuan, L., Powell, S., & CETIS, J. (2013). MOOCs and open education: Implications for higher education.

PARTICIPANT EXPERIENCE OF THE FIRST MASSIVE OPEN ONLINE COURSE (MOOC) FROM PAKISTAN

Syed Hani Abidi[1] Aga Khan University / University of Oxford
Aamna Pasha[2] Aga Khan University Examination Board
Syed Ali[3] Nazarbayev University / Dow University of Health Sciences

ABSTRACT

Background: In recent years, massive open online courses (MOOCs) have steadily gained popularity. It appears, however, that MOOC learners are concentrated mostly in the affluent English-speaking countries. MOOCs' free-of-cost, easy accessibility should make them obviously attractive to participants from low-and-middle-income countries (LMIC). The reason why LMIC enrollments in MOOCs are so low is therefore unclear. In the year 2014, the first MOOC was launched from Pakistan. We administered a survey to the enrollees of this MOOC to explore concerns, fears, and limitations that might be deterring the LMIC audience from participating in MOOCs.

Methods: The MOOC was a three-week course on bioinformatics that covered current concepts and techniques employed in the area of computer-based drug design. More than 230 participants enrolled for this course. At the end of the course, to examine the MOOC experience from their perspective, we invited the participants to take an online survey.

Results: Fifty-four participants, mostly from Pakistan, completed the survey. The participants reported satisfaction with the course, and felt that the course participation was an enriching experience. Although they appeared eager to explore MOOC learning, we found that the learners from LMICs may not be completely comfortable with various aspects of online learning.

Conclusion: Our results indicate that there is a definite market for MOOCs in LMICs. Computer accessibility and literacy must be enhanced in the LMICs to allow the citizens of these regions to feel comfortable with e-learning. Moreover, LMIC nations acknowledge their own unique learning cultures and experiences when they produce and share their MOOC offerings with the world.

KEYWORDS: Massive Open Online Course (MOOC), LMIC, Pakistan, Biochemistry, Bioinformatics, Instructional Media Design, Structural Biology

[1] Department of Biological and Biomedical Sciences, Aga Khan University, Karachi, Pakistan/ Nuffield Department of Medicine, University of Oxford, Oxford-UK
[2] Aga Khan University Examination Board, Karachi, Pakistan
[3] Department of Biomedical Sciences, Nazarbayev School of Medicine, Nazarbayev University, Astana, Kazakhstan / Department of Pathology, Dow University of Health Sciences, Karachi, Pakistan

PARTICIPANT EXPERIENCE OF THE FIRST MASSIVE OPEN ONLINE COURSE (MOOC) FROM PAKISTAN

Syed Hani Abidi[xxiii] Aga Khan University / University of Oxford
Aamna Pasha[xxiv] Aga Khan University Examination Board
Syed Ali[xxv] Nazarbayev University / Dow University of Health Sciences

BACKGROUND

In recent years, e-learning has steadily gained popularity in academia (Mulder & Janssen, 2013). Starting in the early 2000s, massive open online courses (MOOCs) were initiated by certain major American and European universities (Mulder and Janssen, 2013; Bayne, 2015; Aboshady, 2015). Free online learning and open enrollment for all has been an integral part of the MOOC philosophy (Esposito, 2012; Suen, 2014; St Clair et al., 2015).

Aside from affordability, MOOCs offer wide accessibility to participants all over the world (Sandeen, 2013; Freitas, 2015). These features have added a great deal of appeal to MOOCs, especially for students for whom travelling to and enrolling with major universities is a challenge. Provided learners have Internet access, they are able to participate in any MOOC regardless of their economic limitations, geographical boundaries, and time zone restrictions (McAuley, 2010).

For the reasons cited above, and especially in light of financial constraints, participants from Low and Middle Income Countries (LMIC) should find MOOCs particularly appealing. However, learners as well as teachers of MOOCs are concentrated mostly in affluent English-speaking countries (Waldrop, 2014). To date, very few MOOCs have been offered from LMICs; in Asia, only China, Indonesia, India, and Malaysia have initiated MOOCs (Wilson & Gruzd, 2014).

In 2014, from the platform of Aga Khan University, Karachi campus, a MOOC was launched from Pakistan. This was a three-week course titled, “Drug Discovery – a computer-based approach.” The MOOC covered current concepts and techniques used in computer-based drug design. The course attracted 230 enrollments including undergraduate, graduate and post-graduate students, healthcare professionals, researchers, and university faculty.

In this study, we have examined the Drug Discovery MOOC experience from the learners' perspective. Using data gathered through an online survey, we have analyzed how participants viewed this MOOC initiated from an LMIC, what concerns and expectations these participants identified, and what might be the factors deterring a potential LMIC participant from enrolling in a MOOC.

METHODOLOGY

MOOC AND POST-MOOC ONLINE SURVEY

The Aga Khan University-based MOOC was a three-week course on bioinformatics that covered current concepts and techniques used in computer-based drug design in which participants could participate at no cost. However, the course also offered a Certificate Track, wherein registered participants, after covering nominal processing charges and completing all course-related tasks and quizzes, could obtain a university-verified certificate. Regardless of whether a MOOC participant had enrolled in the Certificate Track, each participant who completed the course received an invitation to take an online exit survey. In addition to collecting basic information about the course participants, such as age, level of education, country, level of education, income, and so forth, the survey explored the factors that determined their fears, concerns, and limitations and played into their decision for enrolling in this MOOC. The survey also enquired into the participants' expectations and concerns for a MOOC originating from an LMIC. Of the 230 participants who enrolled in the MOOC, 53 participants completed the survey.

Prior to the commencement of this study, ethical approval was obtained from the Ethical Research Committee, Aga Khan University, Karachi, Pakistan.

RESULTS

PARTICIPANT PROFILE

All but three participants who took the course survey were from Pakistan; the remaining three were from India, South Korea, and Mexico (See Appendix, Table 1). Most survey participants were between 20-29 years of age (n=32). Almost twice as many survey respondents identified themselves as female participants (n=35) than those who self-identified as male participants (n=18). Most MOOC participants who participated in the course survey listed their occupation to be that of student (n=22), while fewer survey respondents indicated they were faculty members and/or researchers (Table 1).

PARTICIPANT LIMITATIONS

Survey participants were asked to indicate their source of course information. Survey participants (n=23) most frequently indicated they came to know about the course through their teachers, colleagues or friends, while email came second as the source of course information participants selected (See Appendix, Table 2). Most survey participants (n=44) did not register for the Certificate Track, indicating they did not do so because they did not have the time to complete all the course assignments (n=17) or were simply not interested in obtaining the course certificate (n=13). Approximately 52% of the survey respondents lacked prior experience with online courses. The majority of the participants had access to a computer and the Internet at their home, and reported no difficulty in using these facilities. A good number of participants also reported being hampered by inconsistent electricity supply (n=22) and restriction on educational websites (n=11) in their country (Table 2).

REASONS FOR ENROLLING IN THE MOOC

The majority of the survey participants (n=37) indicated they had enrolled in the course because they wanted to learn about the subject area in which the course was offered (See Appendix, Figure 1). Other reasons for which the participants enrolled in the course included that they were curious about the course, that they wanted to explore a MOOC offered from a developing country, or that they simply wished to experience an online course (Figure 1).

PARTICIPANTS' CONCERNS AND FEARS ABOUT THE MOOC

Since this was the first MOOC offered from an LMIC, namely Pakistan, we wanted to explore what fears or concerns the participants had before enrolling for this MOOC. Interestingly, the participant response showed that the majority were indifferent to the fact that the MOOC was being offered from an LMIC (See Appendix, Figure 2). Conversely, the majority of the participants anticipated that the course delivery would be effective, the course would be of high quality, and the course material would be up-to-date. Survey participants also indicated that, before enrolling in the course, they held positive expectations about the competency of the course faculty (Figure 2).

PARTICIPANT EXPERIENCE OF THE MOOC

Fifty-three participants who took the survey were asked to share their experience about the following four different aspects of the MOOC, shown in Figures 3A-3D (See Appendix).

- course workload (Figure 3A)
- course design and execution (Figure 3B)
- course faculty (Figure 3C)
- participant's learning experience (Figure 3D)

The majority of participants (n=35) responded that the course involved a heavier work load and a great deal more self-directed learning than they had anticipated (n=24) (Figure 3A).

While commenting on course design and execution, the majority of the survey participants indicated they thought that course design was appropriate (n=50), that the course website was visually appealing (n=49), and that it was well organized and easy to use (n=50). A small number of survey participants indicated that participation in the course was technologically challenging for them (n=16) (Figure 3B).

The majority of the participants were satisfied with the quality and delivery of the course (Figure 3C). Participants unanimously thought that the course faculty member was engaging, and competent in the subject area (Figure 3C).

Overall, survey participants reported having been satisfied with the course (Figure 3D). They indicated that course participation was an enriching experience, and that the course enhanced their knowledge in the subject area. The survey participants also noted that the Drug Discovery MOOC inspired them to take more courses in the subject area, and to apply this knowledge in their research (Figure 3D).

DISCUSSION

In the current study, we have examined the learners' experience of the Drug Discovery online course, the first MOOC to be launched from Pakistan, to date. Using data from an online administered survey, we have analyzed certain aspects of this LMIC-initiated MOOC from the participants' perspective, taking into account their limitations, concerns, and expectations related to participation in this course.

With the advent of the Internet age and its ever-increasing popularity in developing countries, for example in LMICs, MOOCs are thought to hold great promise for promoting public access to quality education (Liyanagunawardena et al, 2013; Castillo et al, 2015). However, most of the MOOC-offering institutions are centered in English-speaking parts of the Western world. Additionally, MOOC participants appear to be located mostly in North America and Europe, with very little representation from Asia, and even less from Africa (Liyanagunawardena et al., 2013; Liyanagunawardena, 2012).

In the Drug Discovery MOOC, all the enrollees except one were from LMICs. This information was encouraging since it showed that an LMIC-initiated MOOC was able to attract enrollments from the developing countries. As noted above, most course participants were graduate students, followed by faculty and researchers. Moreover, survey participants with these occupations reported they had access to computer and the Internet, and were comfortable

using these facilities. Such a level of access to, and literacy with, technology might not be reflective of the general population in an LMIC. However, the data from this study do suggest that members of the population interested in attending online courses are well-equipped with the prerequisites, both technologically and intellectually. While this observation raises a point in favor of developing further MOOCs from and for the LMICs, it also makes an argument for spreading computer literacy throughout the developing world, including the far-flung and impoverished populations of LMICs. Studies have identified that most MOOC participants from developing countries are located in urban centers with access to computers and the Internet. The lack of technological infrastructure, including computer access, Internet connectivity, and electricity supply are some of the major impediments for prospective MOOC participants from the rural areas (Liyanagunawardena et al., 2013; Liyanagunawardena, 2012; Marcial et al., 2015).

Most of the Drug Discovery MOOC participants did not register for the Certificate Track because they either did not have the time to complete all the course assignments, were not interested in obtaining, or could not afford to obtain, the course certificate (as shown in Table 2). While on one hand the participant response indicates their limitations, on the other it reflects positively on their learning philosophy: Most of them did not care about certification but were simply interested in gaining the knowledge. This is again a reminder of how MOOCs, due to their free-of-cost dissemination of knowledge, can be genuinely attractive and beneficial to an LMIC participant.

MOOCs throughout the world have been reported to have low retention rates (Liyanagunawardena et al., 2013; Greene et al., 2015; Zeng et al., 2015). Little is known about the reasons for low retention: One observation is that most of the MOOCs generate an overwhelming amount of information in the form of course materials, which creates difficulty for the participants to maintain full engagement (Liyanagunawardena et al., 2012; Koutropolous et al., 2012; Koutropoulos & Zaharia, 2015). Accordingly, most of our MOOC participants also did not complete the course to the end. One reason for this may be that online learning is a relatively new form of teaching and learning in Pakistan, a delivery format with which students are not yet very familiar. Indeed, while the survey participants reported their satisfaction with the course delivery and website (Figures 3B-C), our course survey also revealed that the participant responses were rather evenly split regarding perceptions of the amount of time, effort, digital literacy, and self-directed learning learners had anticipated would be required for the Drug Discovery course (Figure 3A). In line with these observations is also the fact that half of the MOOC respondents had never taken an online course before (Table 2). On the whole, online teaching and learning is a new phenomenon in these regions; for this reason, students may not have yet

developed the skills required for online learning (*Self-Directed*, 2013; Oyo & Kalema, 2014). These data emphasize that digital and self-directed learning, two important and essential components of MOOC participation need to be adopted widely in LMIC academia so learners will find themselves more at ease with this format of learning and be able to benefit more effectively from online courses.

Our survey revealed that, overall, the participants were satisfied with the course. They thought that course participation was an enriching experience, and that their knowledge in the subject area increased after attending the Drug Discovery MOOC (Figure 3D). Information that came as a pleasant and encouraging surprise was that the majority of the Drug Discovery course participants were indifferent about the fact that the MOOC was being offered from an LMIC. Despite its LMIC-based patronage, the participants anticipated the course delivery would be effective, and had favorable expectations of the course quality and content, and competence of the course faculty (Figure 3C). This information should serves as reassurance to LMIC institutions that have reservations about developing online courses. From the example of the Drug Discovery MOOC it appears that the prospective LMIC-based MOOC participant is more mature than we might have believed, is more interested in gaining knowledge, and is less worried about from where a MOOC is coming.

In conclusion, the launch of the first MOOC from Pakistan heralds promising news. From this experience we learn that the environment in the LMIC academia is ripe for online learning. The prospective LMIC MOOC participant is eager to partake of resources that are time- and cost-efficient, and are effective in enhancing knowledge and skills. However, to make the future MOOC experience more rewarding it is imperative to spread computer literacy more widely in the LMICs. Moreover, LMIC nations such as Pakistan acknowledge their own unique learning cultures and experiences when they produce and share their MOOC offerings with the world.

REFERENCES

Aboshady, O. A., Radwan, A. E., Eltaweel, A. R., Azzam, A., Aboelnaga, A. A., Hashem, H. A., & Noaman, A. M. (2015). Perception and use of massive open online courses among medical students in a developing country: multicentre cross-sectional study. *BMJ open*, *5*(1), e006804.

Bayne, S. (2015). What's the matter with 'technology-enhanced learning'?. *Learning, Media and Technology*, *40*(1), 5-20.

Castillo, N. M., Lee, J., Zahra, F. T., & Wagner, D. A. (2015). MOOCs for development: Trends, challenges, and opportunities. *Information Technologies & International Development*, *11*(2), 35-42.

Esposito, A. (2012). Research Ethics in Emerging Forms of Online Learning: Issues Arising from a Hypothetical Study on a MOOC. *Electronic Journal of e-Learning*, *10*(3), 315-325.

Farid, S., Ahmad, R., Niaz, I. A., Arif, M., Shamshirband, S., & Khattak, M. D. (2015). Identification and prioritization of critical issues for the promotion of e-learning in Pakistan. *Computers in Human Behavior*, *51*, 161-171.

Freitas, S. I., Morgan, J., & Gibson, D. (2015). Will MOOCs transform learning and teaching in higher education? Engagement and course retention in online learning provision. *British Journal of Educational Technology*, *46*(3), 455-471.

Greene, J. A., Oswald, C. A., & Pomerantz, J. (2015). Predictors of retention and achievement in a massive open online course. *American Educational Research Journal*, 0002831215584621.

Hew, K. F. (2015). Promoting engagement in online courses: What strategies can we learn from three highly rated MOOCs. *British Journal of Educational Technology*.

Jordan, K. (2015). Massive open online course completion rates revisited: Assessment, length and attrition. *The International Review of Research in Open and Distributed Learning*, *16*(3).

Koutropoulos, A., Gallagher, M. S., Abajian, S. C., de Waard, I., Hogue, R. J., Keskin, N. Ö., & Rodriguez, C. O. (2012). Emotive vocabulary in MOOCs: Context & participant retention. *European Journal of Open, Distance and E-Learning*, *15*(1).

Koutropoulos, A., & Zaharias, P. (2015). Down the Rabbit Hole: An initial typology of issues around the development of MOOCs. *Current Issues in Emerging eLearning*, *2*(1), 4.

Liyanagunawardena, T. R. (2012). *Information communication technologies and distance education in Sri Lanka: A case study of two universities* (Doctoral dissertation, University of Reading).

Liyanagunawardena, T. R., Adams, A. A., & Williams, S. A. (2013). MOOCs: A systematic study of the published literature 2008-2012. *The International Review of Research in Open and Distributed Learning*, *14*(3), 202-227

Liyanagunawardena, T., Williams, S., & Adams, A. (2013). The impact and reach of MOOCs: a Developing countries' perspective. *eLearning Papers*, (33).

Marcial, D. E., Caballero, R. D. B., Rendal, J. B., & Patrimonio, G. A. (2015). "I AM OFFLINE": MEASURING BARRIERS TO OPEN ONLINE LEARNING IN THE PHILIPPINES. *Information Technologies and Learning Tools*, *45*(1), 28-41.

McAuley, A., Stewart, B., Siemens, G., & Cormier, D. (2010). The MOOC model for digital practice.

Mulder, F., & Janssen, B. (2013). Opening up education. *Trend report: Open educational resources*, 36-42.

Oyo, B., & Kalema, B. M. (2014). Massive open online courses for Africa by Africa. *The International Review of Research in Open and Distributed Learning*, *15*(6).

Sandeen, C. (2013). Integrating MOOCs into traditional higher education: The emerging "MOOC 3.0" era. *Change: The magazine of higher learning*, *45*(6), 34-39.

Self-Directed Learning: The Core of Successful MOOC Participation. (2013, May 1). Retrieved from http://facultyecommons.com/self-directed-learning-complete-a-mooc-successfully/

St Clair, R., Winer, L., Finkelstein, A., Fuentes-Steeves, A., & Wald, S. (2015). Big hat and no cattle? The implications of MOOCs for the adult learning landscape. *Canadian Journal for the Study of Adult Education*, *27*(3), 65-82.

Peer Assessment for Massive Open Online Courses (MOOCs)Waldrop, M.M., Massive open online courses, aka MOOCs, transform higher education and science. *Scientific American*, 2014.

Wilson, L., & Gruzd, A. (2014). MOOCs–international information and education phenomenon?. *Bulletin of the American Society for Information Science and Technology*, *40*(5), 35-40.

Zheng, S., Rosson, M. B., Shih, P. C., & Carroll, J. M. (2015, February). Understanding student motivation, behaviors and perceptions in MOOCs. In *Proceedings of the 18th ACM Conference on Computer Supported Cooperative Work & Social Computing* (pp. 1882-1895). ACM.

APPENDIX

TABLE AND FIGURE LEGENDS

TABLE 1: PARTICIPANT PROFILE: Basic information about the participants of the Drug Discovery MOOC.

TABLE 2: PARTICIPANT PREFERENCES: Information about the participants' enrollment in the course and registration for the certificate track. The table also provides information about technological limitations of the survey participants in terms of the availability of, and proficiency with, computer and Internet, etc.

FIGURE 1: REASONS FOR PARTICIPATION: The X-axis shows the participants' reasons for attending the Drug Discovery MOOC, while the Y-axis shows the number of participants and their response to each query.

FIGURE 2: CONCERNS AND FEARS: The X-axis shows the fears and concerns that the course participants might have anticipated before attending the Drug Discovery MOOC. The Y-axis shows the number of participants and their response.

FIGURE 3: EXPERIENCE OF THE DRUG DISCOVERY MOOC: The figure shows aspects of participant experience after attending the MOOC. The information is divided into four categories: A) course workload, B) course design and execution, C) course faculty and, D) learning experience. The X-axis shows the aspects of participant experience, while the Y-axis shows the number of participants who responded.

TABLE 1: PARTICIPANT PROFILE

Parameter	Category	Number of Participants
Age	20-29	32
	30-39	15
	40-49	4
	50-59	2
Gender	Male	18
	Female	35
Country of Residence	Pakistan	50
	India	1
	South Korea	1
	Mexico	1
Occupation	Student	22
	Faculty and Researcher	15
	Medical doctors and Pharmacist	8
	Laboratory and Administrative Staff	3
	Engineer	1
	Unemployed	2
	Undisclosed	2
Highest level of education	High School	5
	Undergraduate	17
	Graduate or above	31
Yearly income (in US $)	0-100	8
	100-500	2
	500-1000	2
	1000 and above	8
	Prefer not to respond	33

TABLE 2: PARTICIPANT PREFERENCES

Parameters	Category	Number of Participants
Information about MOOC	Email	18
	Flyer on notice board	4
	Teacher, colleague, or friend	23
	Facebook	6
	Aga Khan University website	9
Registration for certificate Track	Yes	9
	No	44
Reasons for not registering for the Certificate Track	Could not afford the fee	14
	Did not have time to complete the assigned tasks	17
	Found the assigned tasks too difficult to complete	1
	Information about Certificate Track was not clearly conveyed	2
	Not interested in obtaining a certificate	13
	Reason not cited	2
	I have registered for Certificate Track	9
Prior experience for online courses	Yes	25
	No	28
Computer at home	Yes	46
	No	7
Internet at home	Yes	46
	No	7
Computer at work/study place	Yes	48
	No	5
Internet at work/study place	Yes	3
	No	50
Inconsistent electric supply	Yes	22
	No	31
Certain educational websites blocked	Yes	11
	No	42
Difficulty in using computer	Yes	0
	No	53
Difficulty in using internet	Yes	3
	No	50

Color Key for Figures 1-3

Strongly agree Agree Disagree Strongly disagree

FIGURE 1

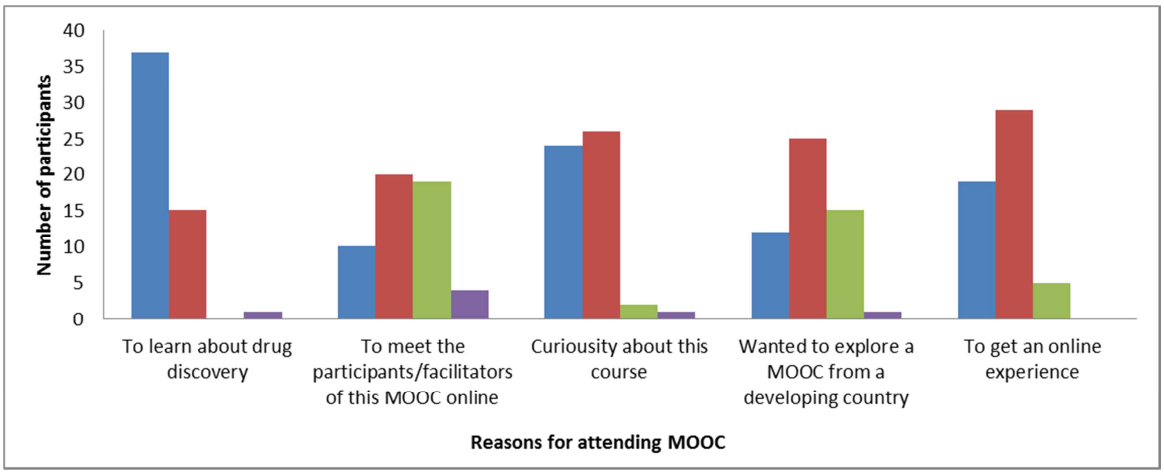


FIGURE 2

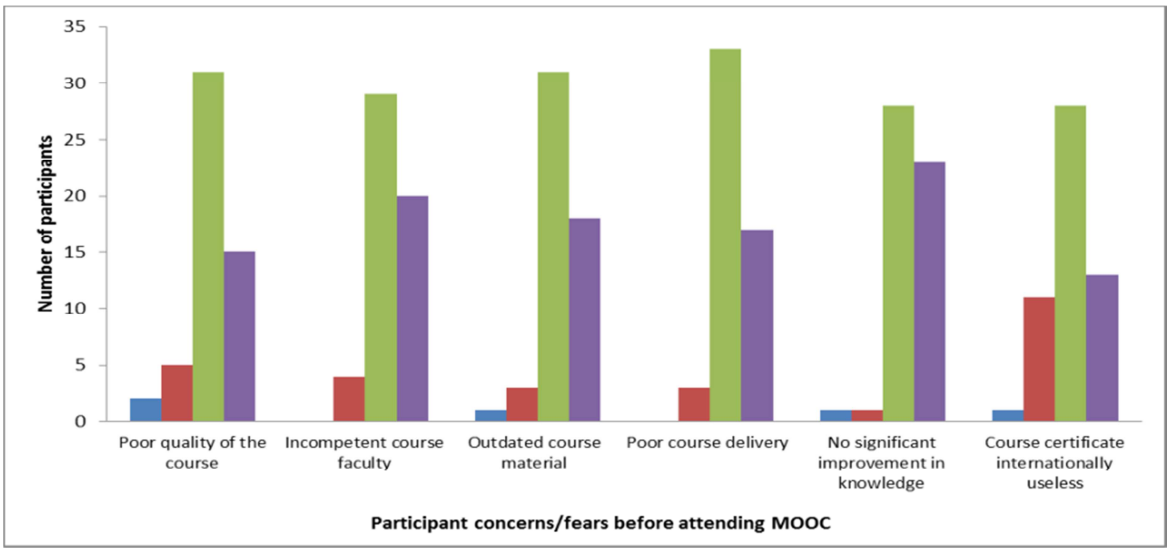
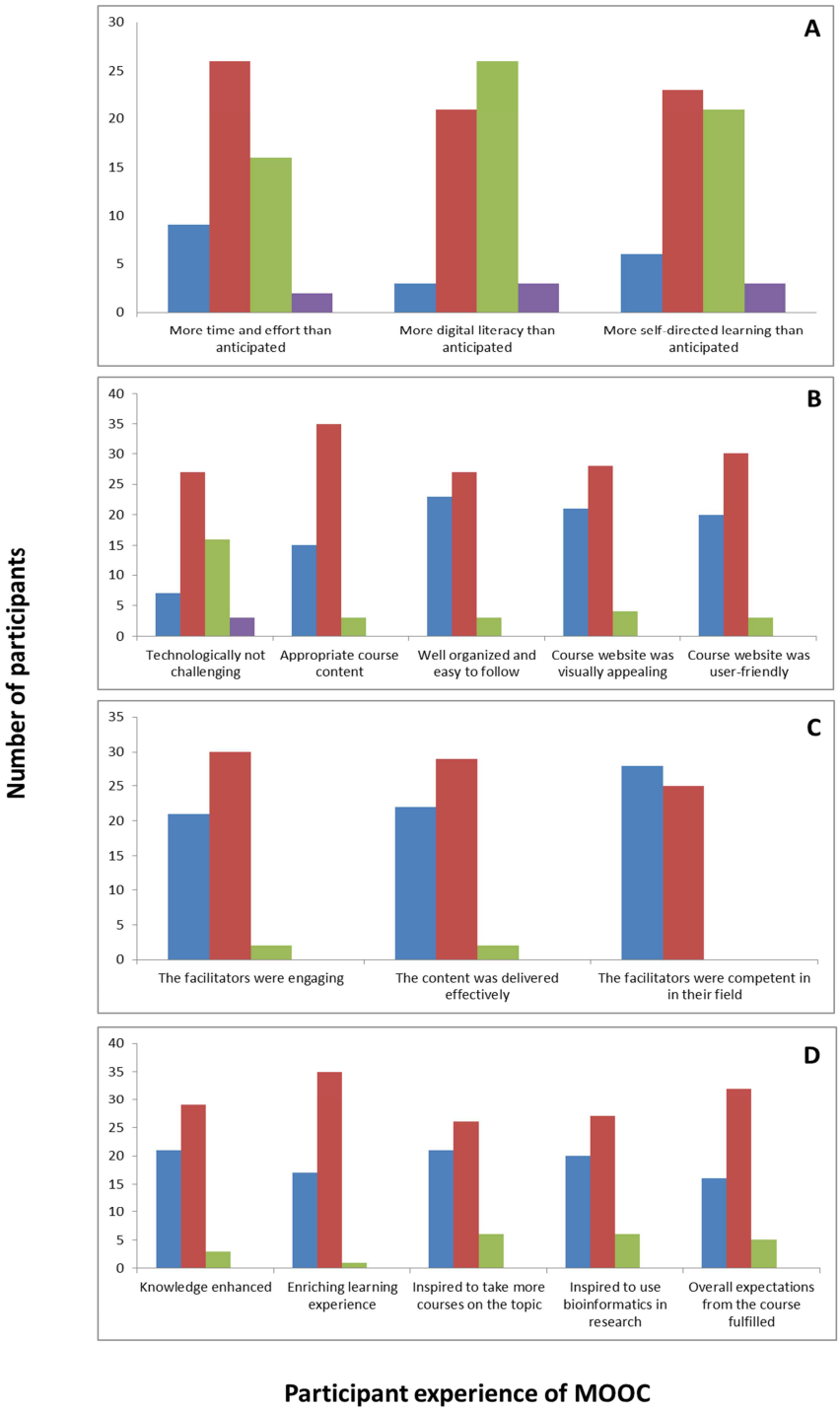


FIGURE 3


A
30
25
20
15
10
5
0
More time and effort than anticipated
More digital literacy than anticipated
More self-directed learning than anticipated
B
40
35
30
25
20
15
10
5
0
Technologically not challenging
Appropriate course content
Well organized and easy to follow
Course website was visually appealing
Course website was user-friendly
C
35
30
25
20
15
10
5
0
The facilitators were engaging
The content was delivered effectively
The facilitators were competent in in their field
D
40
35
30
25
20
15
10
5
0
Knowledge enhanced
Enriching learning experience
Inspired to take more courses on the topic
Inspired to use bioinformatics in research
Overall expectations from the course fulfilled
Number of participants
Participant experience of MOOC

AUTHOR BIOS

[i] **Robin Bartoletti, PhD** is the Instructional Designer at the Center for Innovative Learning at the University of North Texas Health Science Center. Her areas of research and expertise are Online Course Design, Design Thinking, Maker Education, eLearning, social media, and educational technologies. She also has served as faculty supervising online course and program development, faculty training, and consulting in online and blended learning. Robin has more than 15 years of experience in all levels of educational technology and has led numerous presentations and workshops around the country. She is the author of several educational publications and has led MOOCs for the Canvas Network.

[ii] **Sarah Honeychurch** is a Learning Technology Specialist and Graduate Teaching Assistant (Philosophy) at the University of Glasgow who specialises in Jigsaw Classroom teaching and other co-operative learning techniques. Sarah is also studying for a PhD at the University of Glasgow in the effectiveness of peer interaction and is looking at online experience. She is an editor of *Hybrid Pedagogy*, an open-access, peer-reviewed journal.
Twitter: @NomadWarMachine Blog: www.NomadWarMachine.co.uk Email: Sarah.Honeychurch@Glasgow.ac.uk

[iii] **Bonnie Stewart** is an educator and social media researcher fascinated by who we are when we are online. Coordinator of Adult Teaching programs at the University of Prince Edward Island, Canada, her work explores professional learning, the intersections of knowledge, technology, and identity, and the implications of networks for contemporary institutions. Bonnie writes and speaks about networked scholarship, social media literacies, digital identities, and massive open online courses (MOOCs), and blogs ideas at http://theory.cribchronicles.com. She does her best thinking out loud on Twitter as @bonstewart. Email: bstewart@upei.ca Web: http://bonstewart.com/

[iv] **Maha Bali** is Associate Professor of Practice at the Center for Learning and Teaching at the American University in Cairo. She holds a PhD in Education from the University of Sheffield, UK. She is an editor at the journal, *Hybrid Pedagogy*, and serves as an editorial board member of two journals: *Journal of Pedagogic Development* and *Learning, Media and Technology*. She is a Prof Hacker blogger, and co-founder of virtuallyconnecting.org and edcontexts.org. Email: bali@aucegypt.edu and Twitter: @bali_maha

[v] **Rebecca J. Hogue** is pursuing a PhD in Education at the University of Ottawa. She is an Associate Lecturer in the Instructional Design M.Ed. Program at the University of Massachusetts Boston. Her professional background is in instructional design and software quality assurance. She holds a Master of Arts Degree in Distributed Learning, and a Bachelor of Science Degree in Computer Science. Rebecca is a prolific blogger, currently sharing her academic experiences (http://rjh.goingeast.ca) and her lived experience through breast cancer treatment (http://bcbecky.com). In addition, she and her husband have a travel blog describing their 16-month journey around the world without airplanes (http://goingeast.ca). Rebecca's PhD research involves investigating the impact illness blogs have on patient engagement (http://livingpathography.org). Rebecca currently resides in Sunnyvale, California.

[vi] **Dave Cormier** is an educational activist, researcher and online community advocate. He has published on open education, Rhizomatic Learning, MOOCs (Massive/Open Online Courses), and the impact of technology on the future of high education. He coined the term MOOC in 2008 and has facilitated, consulted and participated in dozens of large open courses.

[vii] **Keith Hamon** teaches composition and literature at Middle Georgia State University. He previously administered educational technology programs in both higher education and K12 schools. Currently, he is exploring with a school of scholars from around the world the effects of networking structures on the way we write and learn. Email: keith.hamon@gmail.com Twitter: @kwhamon Blog: blog.keithwhamon.net

[viii] **Apostolos Koutropoulos** ("AK") is the program manager for the online M.A. program in Applied Linguistics at the University of Massachusetts Boston. He is also an adjunct faculty member of the Instructional Design M.Ed. program. Over the last few years he has participated in many massive online open courses (MOOCs) and has co-authored research papers with his colleagues in the MobiMOOC Research Team (MRT). AK holds a B.A. in computer science, an M.B.A. with a focus on human resources, an M.S. in information technology, an M.Ed. in instructional design, and an M.A. in applied linguistics. He is currently an Ed.D. student at Athabasca University. His research interests include online learning, knowledge management, educational technology, linguistics, and games in education. Contact Information: Apostolos Koutropoulos, University of Massachusetts Boston, Department of Applied Linguistics, 100 Morrissey Boulevard, Boston, MA, 02125, USA, Tel: +1 617 287 5760, Email: a.koutropoulos@umb.edu

[ix] **Scott Johnson** (@SHJ2) worked in the building trades until 2009, both as an apprentice and then teaching apprentices. In the last few years he has worked casually at a small community college in Northeast Alberta, editing online courses. Developing an interest in cMOOCs as a means of recovering his right to be curious, he is now no longer affiliated with any institution and exists pretty much online.

[x] **Ronald Leunissen** holds several academic degrees in medicine and psychology, and works as a senior educational advisor at the Radboud University Medical Center in Nijmegen, the Netherlands. He supports health professionals in developing and implementing undergraduate programs for medical doctors, dentists and health scientists. In the past 25 years he has co-developed several new programs including writing learning goals, acquiring educational resource planning software and managing the implementation process. He was secretary to the national committee that wrote the basic learning goals for all Dutch physicians, which are published as "The 2009 framework of undergraduate medical education in the Netherlands" and are now part of the law. Currently his special attention goes to the design of inter-professional team-based student-run clinics for undergraduate students in dentistry and oral health care.

[xi] **Lenandlar Singh** is a Senior Lecturer in the Department of Computer Science at the University of Guyana. He teaches undergraduate computer science and graduate level information systems. His research focuses on computer science education, security and usability of software systems and learning technologies. Email: lenandlar.singh@uog.edu.gy

[xii] **Panagiotis Zaharias** is currently an adjunct professor at the Open University of Cyprus and a freelance UX researcher. Main research interests are focused on UX and usability evaluation methods, educational technologies, game-based learning, serious games and gamification. He has published more than 50 papers in journals and conference proceedings. Contact Information: Panagiotis Zaharias, Open University of Cyprus,, Information and Communications Systems, Faculty of Pure and Applied Sciences,, PO Box 12794, 2252,Latsia,Cyprus,, Tel.: +357 22 411600, Fax: +357 22 411601, Email: pz@aueb.gr

[xiii] **Christopher Pappas** is currently founder and CEO of The eLearning Industry's Network, the largest online community of professionals involved in the eLearning Industry. Christopher holds an MBA, and an MEd (Learning Design) from Bowling Green State University. Main research interests are focused on UX, learning technologies, social learning, and gamification. Contact Information: Christopher Pappas, eLearning Industry LLC, 220 Sansome St., Ste. 900, San Francisco, CA 94104. Email: cpappas@elearningindustry.com

[xiv] **Matt Crosslin, PhD**, is the Learning Innovation Coordinator for The University of Texas at Arlington's Learning Innovation and Networked Knowledge (LINK) Research Lab. Through his work at LINK Lab, he has been pioneering a new course design methodology that allows for learner-created customizable pathways through course content. His current research interests include instructional design, learner agency, emerging technologies, open learning, sociocultural theory, heutagogy, and networked learning. He has been involved in education since 1994, teaching everything from face-to-face 8th grade science classes to Massive Open Online Courses such as Humanizing Online Education (the #HumanMOOC). He has also been an active blogger since 2007 at EduGeekJournal.com. Email: matt@uta.edu

[xv] **Donna Harp Ziegenfuss, EdD,** is an Associate Librarian in the J. Willard Marriott Library at the University of Utah. She has 15 years of faculty and professional development experience; 12 years of traditional, hybrid, and online formats teaching experience; and over 10 years of experience in academic libraries. Her research interests focus on library and technology-based instructional planning and course design, assessment and evaluation, academic leadership, and qualitative research. As a qualitative researcher, she is interested in understanding how dispositions impact learning, and how conceptual change theory can be applied to developing reflective and engaged instructors. She routinely crosses disciplinary boundaries and relies on relationship building and partnerships to uncover broader educational connections. She values the potential of interdisciplinary perspectives to design engaging and integrative learning environments for all learners. Email: donna.ziegenfuss@utah.edu

[xvi] **Molly Goldwasser** is the Associate Vice Provost for Academic Affairs at Duke University. At the time of article submission, she served as the Assistant Vice Provost and Manager of Institutional Assessment and Accreditation in the Office of the Provost. Her professional background and her research portfolio center on assessment, educational access and equity, and teaching and learning. Goldwasser earned a Bachelor's degree in Public Policy Studies from Duke University, a Master's degree in Curriculum and Instruction from the University of Mississippi, and a Doctorate of Education in Education Leadership and Policy from Vanderbilt's Peabody College. Email: molly.goldwasser@duke.edu

[xvii] **Chris Mankoff** is an Associate at ICF International. In this position he programs and processes commercial and government survey data. He has extensive experience managing educational data, and has published and presented on online education. He formerly served as a data manager/application developer for the Duke Center for Autism and Brain Development. In this role he managed vendors in the development of clinical trials database applications, developed clinic trial datasets for use by statisticians, and designed web-based data capture forms. Prior to January 2015, he served as the online data manager for Duke University, in which position he collected, managed, distributed and analyzed Coursera data for classes taught by Duke University professors. Email: chris.mankoff@icfi.com

[xviii] **Kim Manturuk** manages research and evaluation for the Center for Instructional Technology at Duke University. She is responsible for data collection and analysis to assess the effectiveness of Duke's online course programs. She also collaborates with faculty teams to evaluate experiments and innovations in educational technologies. Kim is particularly interested in how online technologies can expand access to education for people with disabilities. Kim holds an M.A. and Ph.D. in Sociology from the University of North Carolina at Chapel Hill and received her B.A. from Indiana University.

[xix] **Lorrie Schmid, MA, PhD** is a recent graduate of the Department of Educational Psychology at the School of Education at the University of North Carolina, Chapel Hill. Her work as manager, data and analytics for the Education and Human Development (EHD) Incubator) involves supporting research and research collaborations related to data on education and human development through providing data management expertise to EHD researchers focusing on capacity to store, analyze and link sensitive data. Her interests include: adolescent social development, and issues of peer influence, as well as methodological and statistical interests in data matching, secure brokering, and data harmonization. She previously served as a Data Manager and Research Analyst at the Center for Child and Family Policy, Duke University. Email: schmid@duke.edu

[xx] **Keith E. Whitfield** is the Vice Provost for Academic Affairs at Duke University. He holds appointments as Professor in the Department of Psychology and Neuroscience and Research Professor in the Department of Geriatric Medicine at Duke University Medical Center. He is also the co-Director of Duke's Center on Biobehavioral Health Disparities Research. He earned a Bachelor's degree in Psychology from the College of Santa Fe, Santa Fe, NM and a M.A. and Ph.D. in Life-Span Developmental Psychology from Texas Tech University in Lubbock, TX. He also received post-doctoral training in quantitative genetics from the University of Colorado in Boulder, CO. He has published more than 180 articles, books and book chapters on cognition, health, and individual development and aging with a focus on African Americans. He currently serves as the Managing Editor for the journal *Ethnicity and Health* and has served as an ad-hoc reviewer and/or editorial board member of multiple journals. He is the member of several professional associations and a past chair of the Behavioral and Social Sciences Section of the Gerontological Society of America.

[xxi] **Carol A.V. Damm** is an Instructional Designer at Graduate Professional Studies, a division of the Rabb School of Continuing Studies at Brandeis University. She provides course design and development support, consultation in effective pedagogy for both online and face-to-face course environments, and faculty training and professional development to a wide range of faculty subject matter experts, including part-time fully-online instructors and full-time campus-based research faculty. She also develops and supports the creation of dynamic learning content to enhance online teaching and learning. Carol's research interests center on effective course design to support differentiated learning styles and the assessment of online and face-to-face courses to evaluate student engagement and students' success in meeting course outcomes.

[xxii] **Julia Lynn Parra, EdD,** is an Assistant Professor at New Mexico State University. She co-designed and teaches for NMSU's Online Teaching and Learning Graduate Certificate Program and is the coordinator for the Learning Design & Technology programs. Her research interests include the interactions between learning design, technology, innovation, and culturally relevant teaching and learning. She has published and presented on professional development in online teaching and learning for teachers in K12 education, the creation of a course design model for cloud-based student collaboration, digital explorations along the borderlands, technology-based projects for empowering marginalized populations, and innovative models and strategies for designing learning environments such as the use of HyFlex and conducting the first MOOC at NMSU. Prior to receiving her Ed.D. in Learning Technologies from Pepperdine University, she was a middle school teacher with Las Cruces Public Schools. Email: juparra@nmsu.edu

[xxiii] **Syed Hani Abidi** is an Assistant Professor at the Department of Biological and Biomedical Sciences, Aga Khan University, Karachi-Pakistan. He is primarily a biological science researcher, but has interests in designing and executing online courses, especially Massive Open Online Course (MOOCs) from and for the developing countries. Together with Syed Ali, he offered the first MOOC from Pakistan. His research focus in education is to produce virtual classrooms for health education that can provide innovative teaching and learning opportunities to health science students, teachers, and professionals.
Email: syed.abidi@aku.edu

[xxiv] **Aamna Pasha** is the Assistant Director of Teacher Development at the Aga Khan University Examination Board where she oversees teacher development across affiliated schools in Pakistan. Aamna completed her Master of Arts in Development Education from the Institute of Education, University College London (UCL). She has extensive experience in teacher training and in the use of technology to support teaching. Prior to her current role, Aamna worked at the Aga Khan University's Institute of Educational Development where her responsibilities included designing and transforming the modality of University-wide existing courses from face-to-face to blended modes and facilitating faculty in the delivery of these. Email: aamna.pasha@aku.edu`

[xxv] **Syed Ali** is an Associate Professor at Nazarbayev University, Astana, Kazakhstan. For the past 12 years, his research group has been studying evolution of HIV and other viruses in Asia, Africa, and Europe. Syed Ali has designed undergraduate and graduate level courses, in the areas of critical thinking, virology, oncology, and film criticism. He is an expert in e-learning, and has offered several online courses, including two massive open online course (MOOC).